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THE
AMERICAN
JOURNAL OF OBSTETRICS

AND
DISEASES OF WOMEN AND CHILDREN.

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VOLUME XV.
JANUARY, APRIL, JULY, OCTOBER, 1882.

New York:

WILLIAM WOOD & CO., PUBLISHERS,
56 & 58 LAFAYETTE PLACE.

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6/1/06

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THE AMERICAN
JOURNAL OF OBSTETRICS
AND
DISEASES OF WOMEN AND CHILDREN.

VOL. XV.] JANUARY, 1882., [No. 1.

ORIGINAL COMMUNICATIONS.

DIAGNOSIS OF OVARIAN CYSTS BY MEANS OF THE
EXAMINATION OF THE CONTENTS.

BY

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New York.

(With Sixty-one Woodcuts.)

FLUIDS tapped from supposed tumors are often sent to New York and other scientific centres, in order to obtain an authoritative diagnosis from some expert. The question, if a diagnosis can be based on the mere examination of such fluid, is therefore of great practical importance. If we search books and journals, we will find a good deal of information on the subject, but the views expressed by different observers in regard to the diagnostic value of the physical, chemical, and microscopical characters of the different fluids vary to such an extent that I have felt inclined to examine the question anew by direct observation, hoping that a careful study of the rich material occurring in this metropolis might contribute somewhat to settle it.

At the first meeting of the American Gynecological Society, one side of the question was incidentally touched upon.¹ Dr. Robert Barnes said that it was not the first time he had seen

¹ Transactions. Vol. i., pp. 194-197.

fallacious results follow a microscopical examination of fluid drawn from a tumor in the abdominal cavity, or even from an ovarian cyst. Dr. Engelmann declared that he did not think that we could make a diagnosis by means of the microscope. Dr. Chadwick stated that he had sought for the ovarian cell in many ovarian fluids, and submitted many fluids to more experienced microscopists than himself, invariably without success. Dr. Thomas said that the average microscopist certainly could not make a diagnosis of ovarian cysts by examining the fluid contained in the cavity of the sac. On the other hand, Dr. Byford remarked that, so far as his experience went, perhaps covering thirty-five or forty cases, in which the tumor had proved to be ovarian, the ovarian corpuscles, as described by Dr. Drysdale, had been found.

Dr. Emmet¹ has in two instances of doubt operated and removed ovarian tumors after experts were unable, from an examination of the fluid, to give the slightest information in regard to the character of the tumor.

Again, Dr. Goodell² in a clinical lecture said, in speaking of the fluid withdrawn from a tumor, "It is syrupy and of brownish color. It looks very like that of an ovarian cyst, but *I shall defer giving a positive diagnosis until it has been examined by the microscope,*" thereby showing that he expected to gather valuable information from this kind of examination.

W. L. Atlee placed great confidence in the diagnostic value of the physical, chemical, and morphological properties of the fluids tapped from the abdomen, as appears from several passages of his celebrated work on "The Diagnosis of Ovarian Tumors." He thought that, in the large majority of cases, a mere glance at the fluid sufficed to draw a very correct inference as to the character of the disease.³ As to chemical tests, he thinks that the great excess of albumen would be very valuable as confirmatory of the diagnosis of ovarian disease. "In doubtful cases," says he, "the microscope furnishes the most positive means of deciding the question. . . . I know of no other fluid, whose physical, chemical, and microscopical character corresponds with those of the fluid of an ovarian cyst."

¹ T. A. Emmet: Principles and Practice of Gynecology, second edition, Philadelphia, 1880, p. 797.

² Wm. Goodell: Lessons on Gynecology, Philadelphia, 1879, p. 295.

³ W. L. Atlee: Diagnosis of Ovarian Tumors, Philadelphia, 1873, pp. 56, 58, 60.

A whole chapter in Atlee's book, as well as a paper read before the American Medical Association,¹ contain Dr. Drysdale's views on the subject. This author has a greater experience with regard to ovarian and other abdominal fluids than any other investigator. Nay, it is not unlikely that his "over fifteen hundred cases of abdominal fluids"² beat the united experience of all the other observers who have put on record the results of their examinations. No wonder, therefore, that Dr. Thomas, in the above-mentioned discussion, had to state that in no case in which he had sent fluid to Dr. Drysdale for examination, and he had made the diagnosis of ovarian tumor, had he (Thomas) failed to find an ovarian tumor present. But with all regard due to this indefatigable observer, and with entire faith in his skill on this point, we must still guard ourselves against being led into error by his teachings. Dr. Drysdale declares³ that he has found the ovarian granular cell *almost* invariably present, which implies that even in his own experience ovarian fluids have occurred in which he failed to find it. On the other hand, he "means not to assert that cells, having a similar appearance, may not be found in cysts met with in other parts of the body;" but this cell, when found in this locality, he believes to be "pathognomonic of ovarian disease." Later in this paper we will see that he states himself to have found these bodies in a case of renal cyst.

E. R. Peaslee⁴ confounded Drysdale's corpuscles with the much larger "gorged granule" (read "cell gorged with granules") of Nunn, and says that he himself has not been able to detect them in the fluid of all cysts known to be ovarian.

Most English authors are more or less opposed to the idea that a diagnosis can be derived from the nature of the fluid. Baker Brown⁵ had investigated the question with his friend Mr. Nunn, and gives the conclusions arrived at by the latter in these words: "What I believe to be the value of a micro-

¹ T. M. Drysdale: On the Granular Cell found in Ovarian Fluid, Philadelphia, 1873. Extracted from the Transactions of the American Medical Association.

² Amer. Gyn. Trans., vol. i., p. 195.

³ Reprint of paper, p. 3.

⁴ E. R. Peaslee: Ovarian Tumors, New York, 1872, p. 117.

⁵ Baker Brown: Ovarian Dropsy, London, 1868, p. 47.

scopical examination of a fluid is, that it may serve to strengthen an opinion; but alone, it ought not to decide one." Sir J. Y. Simpson¹ expressed himself thus: "There are no deductions of any practical import, so far as I know, to be drawn from the contained fluid." Mr. Spencer Wells² gives a copious abstract of Eichwald's paper (see p. 12), but does not once, in his long chapter on diagnosis, say that he has gained any light from the microscopical examination of the fluid. As to the chemical characters, he states that reliance cannot be placed on them. In his more recent lectures on abdominal tumors,³ he states likewise what Bennett and Drysdale have found, but does not say that he ever has derived any benefit from this kind of examination. By means of the serous character of the fluid, and blood being intimately mixed with it, he has sometimes satisfied himself that tumors which others considered to be ovarian, were really fibrocystic uterine growths.⁴ Graily Hewitt,⁵ says that a microscopical examination may serve to strengthen an opinion, but alone ought not to decide one, except in the case of a dermoid cyst. Matthews Duncan⁶ said in 1875: "We are still without means of diagnosing ovarian dropsy by examination of the fluid." Lawson Tait⁷ says still later: "Great hope has been entertained that by chemical analysis of the fluid removed by tapping, or by the microscopical investigation of elements contained in it, assistance might be gained in the diagnosis of doubtful cases; but after having, as I believe, read everything which has yet appeared on the subject, and after having devoted a very considerable amount of labor to both of these inquiries, I have come deliberately to the opinion that the hope is fallacious. As yet no chemical compound is known which is peculiar to ovarian fluid, and I am absolutely certain that no microscopical element is of any value for differential diagnosis." According to the same author,⁸ Dr. McMunn, of Wol-

¹ J. Y. Simpson: *Diseases of Women*, New York, 1877, p. 400.

² T. Spencer Wells: *Diseases of the Ovaries*, London and New York, 1872, pp. 89-116, p. 133.

³ *Lancet*, 1878, June 15th, p. 883.

⁴ *Diseases of the Ovaries*, p. 201.

⁵ Graily Hewitt: *Diseases of Women*, first American edition from second London edition, 1868, p. 329.

⁶ *Edinburgh Med. Journ.*, March, 1875, p. 842.

⁷ Lawson Tait: *Diseases of Women*, London and Edinburgh, 1877, p. 270.

⁸ *Lancet*, February 7th, 1880.

verhampton, has tried the spectroscope, and his investigations led only to negative results.

Knowsley Thornton¹ is the English author who seems to place most confidence in the nature of the fluid as a guide in the diagnosis of ovarian and kindred tumors, but he lays more stress on the physical properties than on the microscopic elements of the fluid. Withal his expressions are very guarded, and do not promise more than a probability. As to Drysdale's corpuscle, "he does not think he is prepared altogether to pin his faith to this ovarian cell or any single cell as a certain test; but he thinks its presence, along with other elements which we usually find in ovarian fluids, is a very valuable piece of confirmatory evidence in any doubtful case."

Passing to Germany, we find the great microscopist, Waldeyer, and the practical ovariologist, Spiegelberg, alike positive in their declarations in favor of the diagnostic value of the examination of the fluid. The former states² that he has examined fluid tapped from about twenty cases in Spiegelberg's clinic, and "never has the result deceived him, at least so far as operation or post-mortem examination has afforded an opportunity to test its correctness." Spiegelberg³ says that "if the examination of the fluid gives a certain result, be it negative or positive, then it is absolutely reliable, in which respect it differs from all other symptoms or signs;" and in another place⁴: "The diagnostic puncture does not always give positive information as to the origin of an abdominal fluid, but when it does so, the result is decisive, while the physical and other kinds of examination yield only doubtful results."

But both these authors speak only of the diagnosis between ovarian and ascitic fluid, which is much easier than that between the fluid from an ovarian cyst and that from other cysts.

According to Westphalen,⁵ the tests of paralbumen and metalbumen are unreliable. He lays most stress on the spontaneous coagulation or non-coagulation, but adduces cases to prove that even this may deceive. As to the microscopical

¹ *Med. Times and Gazette*, May 13th, 1876, p. 519.

² *Archiv für Gynäkologie*, 1870, Vol. i., p. 266.

³ *Volkman's Klinische Vorträge*, No. 55, p. 436.

⁴ *Archiv für Gynäkologie*, 1872, Vol. iii., p. 282.

⁵ *Archiv für Gynäkologie*, 1875, Vol. viii., pp. 80-81.

elements, he takes, like Spiegelberg, the presence of columnar epithelial cells to be decisive, but says that often they are not found. Then he thinks that so considerable an amount of so large granular globules would scarcely be found in any other fluid than that of an ovarian cyst. He does not at all mention the small granular cell, which, according to Dr. Drysdale, is the characteristic element.

In the French literature I find that the great ovariologist, Kœberlé,¹ declares that "in most cases the results of an exploratory tapping can settle the diagnosis." He bases it on the presence of paralbumen and the granular globules, by which he means the large granular cells (Bennett's corpuscles). The small granular body is by him taken to be Lebert's pyoid bodies.² Péan, so famous for his success in the ablation of the uterus for fibroids, holds the physical, chemical, and histological examination of the fluid contained in abdominal tumors to be one of the most reliable elements of the diagnosis.³

This great diversity of views among so good observers is, I believe, to a great extent attributable to a confusion of what is the rule and what the exception. Some authors have claimed that this or that property is characteristic of ovarian fluid, and, therefore, an infallible guide to a sure diagnosis; others have found cases where the rule did not hold good, and disgusted they have given up the whole subject as utterly worthless. I believe that the truth is to be found midway between these extremes, and that the examination of the fluid affords a very valuable aid to diagnosis, but that it would be rash to base a diagnosis on the characters of the fluid alone.

In the following pages I shall give a description of ovarian fluid, based on my own observations carried on during eighteen months; but where my material gives out I shall supplement my own experience by that of others.

¹ E. Kœberlé: *Des Maladies des Ovaires et de l'Ovariectomie*. Paris, 1878. Extrait du Nouveau Dictionnaire de Médecine et de Chirurgie Pratique, Tome xxv., p. 529.

² Kœberlé: *Opérations d'Ovariectomie*. Paris, 1865, p. 142, and Plate vi., fig. 8, with explanation.

³ J. Péan: *Diagnostic et Traitement des Tumeurs de l'Abdomen et du Bassin*. Paris, 1880, Vol. i., p. 12.

As appears from the tables at the end of the article, I have divided my material under two heads. The first class, designated as *operative cases*, comprises all those in which the diagnosis was made absolutely certain by operation or autopsy. As operative I have only counted such cases in which I have been able to *follow every step of the operation myself, and examine the cysts after removal both macroscopically and microscopically*. This alone enables the observer to tell with certainty from what kind of cyst a fluid comes. It is sometimes quite difficult even when the abdomen has been opened to tell the precise origin of a cyst, and after the operation has been performed, the character of the part removed may still give rise to controversy. Only by combining all the different means of investigation can we arrive at an irreproachable diagnosis.

In the same class I also include a few cases in which the tumor was not removed during life, but where autopsies offered the same opportunities for an exact diagnosis as in those operated on.

This class comprises fifty-eight cases; viz., fifty ovarian cysts, three cysts of the broad ligament, one uterine fibro-cyst (*myoma lymphangiectodes*), two cysts of the abdominal wall, one renal cyst, and one Battey's operation. At the last I was not present, but in this case there could be no doubt of the diagnosis, since I received the ovaries.

Another class comprises different *fluids removed by tapping*. Here the diagnosis is either as I got it from the gentlemen who treated the patients, or as I made it myself by examination of the fluids. In the former case, the diagnosis is put between quotation marks—" ". In this class the possibility of errors must be admitted, but there is no reason to doubt the accuracy of a diagnosis, made by the attending physician, of ascites from renal or cardiac disease, or of an abdominal tumor in a man, and in some cases the previous tapping was followed by an operation or autopsy, which settled the diagnosis.

It was indispensable to take tapped cases, in order to be able to compare the fluid with that of ovarian cysts, and see if the character found in the latter were of any diagnostic value.

This class comprises thirty-seven cases, supposed to be: fourteen ovarian cysts, three cysts of the broad ligament, one

peritoneal cyst with cancer of the omentum, one cyst of the liver, one renal cyst, one congenital cyst of the neck, one abdominal tumor in a man, one fluid from the thoracic cavity, one hydrocele, one liquor amnii, one blister from scalding, one congestive abscess of femur of five years' standing, five cases of ascites accompanying cancer of the abdomen, and five cases of simple ascites, due to cardiac or renal disease or cirrhosis of the liver.

Characteristics of Ovarian Cysts.—On ovarian cysts we commonly find the Fallopian tube much elongated, and sometimes considerably thicker than normal. It is usually united with the cyst by a distinct ligament formed by a double layer of peritoneum, the so-called *mesosalpinx*. But these characters cannot be used as a reliable basis of a diagnosis, as does Olshausen.¹ I have repeatedly seen the Fallopian tube left behind when an ovarian tumor was removed, so that the pedicle in this case only consists of the ovarian and part of the broad ligament. I have also (in case xxxiii.) found the tube imbedded in the wall of the cyst, the fimbrial end cut off.

The wall may be of very variable thickness. I have found it at least in some places as thin as the finest paper, and in others forming nodules more than an inch thick. It may in every respect be like a cyst of the broad ligament, but one thing is characteristic. It has always a complete *external layer of columnar epithelium*, except in places where it has been bound to other organs by adhesions, and in parts which have grown into the broad ligament, so as to be covered by the peritoneum. It has, likewise, an internal epithelium composed of columnar cells, but these are often in a high degree of fatty degeneration, or are missing in some places. Between these two epithelial layers, which are only observable by aid of the microscope, are uniformly found two layers of tough connective tissue bound together by looser material of the same kind. These two fibrous layers are very easily separated from one another, which is used as a valuable method to overcome adhesions too extensive to be severed, as recommended by Dr. J. F. Miner, of Buffalo. Sometimes the inner layer is subdivisible in two or more layers, but they are always less dis-

¹ Olshausen: *Krankheiten der Ovarien*, Stuttgart, 1877 (Billroth, *Frauenkrankheiten*, vol. vi., p. 148).

tinct. *The ovaries have no peritoneal covering* except quite near the hilus. The outer epithelium is entirely different from the flat endothelium of the peritoneum, and differs only from that found on the inner surface by being a little shorter, and by being always formed by one single row of cells.

We must distinguish between different kinds of ovarian cysts, the simple dropsy of a Graafian follicle, the myxoid proliferating cystoma, the dermoid cyst, the ovarian cyst with parovarian elements, the cysto-sarcoma, and the cysto-carcinoma.

1. *Hydrops Folliculi.*

This seems to be a rather rare form, as I have only met with one instance during this whole investigation. It was case xxxiii. The tumor was very large, containing at least a pailful of fluid. The wall was so thin that while full it was transparent, but when the cyst was emptied, it shrank very much. It had such adhesions in the pelvis that it could only be removed by enucleation, leaving a portion of the outer layer as large as a hand or more in the body. The sac was strictly monocystic, without any trace of proliferation whatsoever, nor of septa. It was white and bloodless, and looked entirely like a cyst of the broad ligament—so much more so as the tube was found imbedded in the wall of the cyst. No trace of ovarian tissue was to be found. Nevertheless, it was ovarian, first, because Dr. Thomas, who performed the operation, was unable to find any ovary beside it, although he looked carefully for it; and, secondly, because I found it covered with the columnar epithelium characteristic of ovarian tumors.

The fluid was limpid, slightly opalescent, foaming, not viscid. The specific gravity was only 1010. Reaction alkaline. It smelled of ether. No spontaneous coagulation took place in it, nor did it coagulate by boiling, nor by adding nitric acid; but by adding a drop of acetic acid a slight coagulation occurred, the fluid becoming entirely clear again by boiling with an excess of the same reagent.

The microscope revealed only a few granules, although the fluid was examined immediately after the operation.

In this case, then, the reaction for paralbumen—coagulation by boiling with a small quantity of acetic acid and redissolu-

tion by boiling with the same reagent in excess—would have been the only thing to indicate that the fluid came from an ovarian cyst.

The wall in collapsed condition was 1.5 mm. thick, and composed of the two usual layers, the outer being tough and white, the inner yellowish-red. They were bound together by uncommonly loose connective tissue.¹

2. *Myxoid Proliferous Cystoma.*

This variety is by far the most common. The name has been given it by Waldeyer,² and forms a happy parallel to the old term *dermoid* cyst. It is derived from the Greek word *μῦξα*, mucus, and recalls the fact that the wall has the character of a mucous membrane, while in a dermoid cyst it has that of skin (*δερμα*).

In the myxoid variety, the inner epithelium is at least partially composed of goblet-shaped cells. It is apt to form pouches, sometimes several rows of them, one below the other, and the underlying connective tissue is full of capillaries and embryonic elements. The differences in the epithelium and the underlying tissue cause the differences macroscopically observed between the two surfaces. The outer surface is smooth, comparatively hard, of a more or less white color. The inner is velvety, slightly uneven, of a reddish color. Sometimes we find yellow spots indicating fatty degeneration, or brown or gray patches indicating sub-epithelial hemorrhagic infarction. More rarely are seen incrustations of lime salts forming bony spiculæ. Often villous excrescences covered all over with epithelium grow from the inside.

Constantly ridges are seen running over the inner surface, marking the place where there formerly has been a septum, and commonly we find either several large cysts; or, if it be a so-called monocystic tumor, somewhere in the wall a small agglomeration of secondary cysts; for, as first pointed out by

¹ Of the three characters attributed to this kind of cysts by Virchow (*Verhandlungen der geburtshülfflichen Gesellschaft in Berlin*, vol. iii., p. 220), viz., size not exceeding the fist of man, complete coagulability by heat, and smooth wall, only the latter was present in this case.

² *Archiv für Gynäkologie*, vol. i., p. 254.

Virchow, all the unilocular cysts, except the simple enlargement of a Graafian follicle, are originally multilocular, and owe their present conformation to the absorption of the partitions separating the different cysts.

Physical Properties of the Fluid.—The color of the fluid found in myxoid ovarian cysts varies very much. I have found it very light yellowish-gray, greenish-yellow, yellowish-red, amber-colored, grayish-brown, dark-brown, like sugar syrup, *café au lait*, turbid port-wine, and molasses. It may be limpid as water and so filled with solid bodies as not to give passage to a ray of light through the bottle in which it is contained. Its consistence is usually more or less viscid, but sometimes it is very slightly or not at all so. The specific gravity expresses its density in a more exact way. I have found this varying from 1013 (case xxiii.) to 1062 (case xl.). The odor of the fluid is in many cases that of the ether used to produce anesthesia, in most it has a faint animal smell. Its reaction is slightly alkaline. In a single case only (xxxviii.), in which the fluid was purulent, and smelled strongly of butyric and kindred fatty acids, was the litmus paper turned red. As a rule the fluid does not form much foam, if any, on the top, but in one case (xxiii.) I found it as foaming as any ascitic fluid.

All these physical characters give the ovarian fluid a certain appearance by which an experienced eye recognizes it at first sight, and will not be mistaken in the great majority of cases; but there are exceptions. I take the viscosity to be the best of all physical signs when it is present, but we have seen that it may be wanting, and on the other hand it may exceptionally be present in other fluids. Thus Schroeder¹ reports a case in which the fluid was brownish, “fluorescent,” of tough, ropy consistence, alkaline reaction, and specific gravity 1023. The following operation showed that it came from the peritoneal cavity, which was in a state of chronic inflammation. Péan² has described a rare disease of the peritoneum under the non-committal name of *maladie gélatineuse du péritoine*, which is characterized by the presence of a fluid like quince-jelly in a

¹ Schroeder: *Krankheiten der weiblichen Geschlechtsorgane*, Leipzig, 1874, p. 380.

² L. c., p. 418.

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tissue as fine as cobweb, from which it breaks out by its own weight.

The specific gravity may be of some aid in distinguishing ovarian fluid from that of cysts of the broad ligament. It has no value in the differential diagnosis of ovarian cysts and ascites except in extreme cases. The color, limpidity, odor, and reaction are not characteristic.

Chemical Properties.—In spite of the strenuous efforts of Eichwald,¹ Scherer, Méhu,² and others, no test has been found by which the fluid from ovarian cysts can be distinguished from that of other fluids. Besides, the tests are so difficult to apply that only expert chemists can obtain reliable results. Not being of their number, I have not investigated this side of the question, excepting what relates to coagulation, which is a consequence of the chemical constitution of the fluid.

Coagulation may be spontaneous which is due to the presence of fibrin, or be produced by heat. Sometimes a drop of acetic acid added to the fluid, by counterbalancing its alkalinity, will considerably increase the bulk of the coagulum. This coagulum is composed of albumen or some of its derivatives. Thornton says³ that "if a fluid is more or less viscid, forms considerable coagulum on heating, which coagulum is either entirely dissolved or turned into a transparent jelly by adding an equal volume of strong acetic acid and continuing the boiling, this fluid is probably from an ovarian cyst. This is a test suggested to Mr. Wells for distinguishing between ovarian and ascitic fluid by the fact discovered by Scherer, that paralbumen is soluble in strong boiling acetic acid, whereas albumen is not." As this test is of easy application, I have tried it in every case except some of the first.

In my experience, as in that of Spiegelberg,⁴ Westphalen, etc., the spontaneous coagulation or non-coagulation is of great value for distinguishing between cystic and ascitic fluids. As a rule, ovarian fluid does not coagulate spontaneously, ascitic fluid does. But what is said of ovarian fluid applies also to cysts of the broad ligament. In no case of cystic fluid exam-

¹ Eichwald in *Würzburger Medicinische Zeitschrift*, 1864.

² Méhu in *Archives Générales de Médecine*, 1869 and 1881.

³ *Med. Times and Gazette*, May 13th, 1876, p. 519.

⁴ Spiegelberg in *Monatsschrift für Geburtskunde*, November, 1869, vol. xxxiv., p. 385.

ined by me has there been a trace of spontaneous coagulation. I mean by cystic, coming from a cyst lined with columnar epithelium, for in case xxvi. which was a large cysto-sarcomatous tumor of the abdominal wall in a man, the fluid formed a large clot by standing. Other observers have come to a similar result in regard to the rule that ovarian fluid does not coagulate spontaneously, but the rule is not without exceptions. Westphalen¹ speaks of four cases observed respectively by Klob, Virchow, Spencer Wells, and himself, in which spontaneous coagulation took place in ovarian fluid. These will be examined in speaking of uterine fibro-cysts.

On the other hand, it is not rare that ascitic fluid does not coagulate spontaneously. It did not do so in tapped cases iii. (cardiac and Bright's disease), xii. (nephritis), and xix. (cancer of the peritoneum), but may be the coagulum had remained in that part of the fluid which was not sent to me. In tapped cases iv. (cancer of the omentum, mesentery and ovary), viii. (cirrhosis of liver), xxvii. (cancer of the omentum), and xxix. (ascites from unknown cause), the coagulum was quite small. Only in tapped case xiv. (cancer of the peritoneum) a large clot was observed, and that was only formed after a couple of days.

By boiling the fluid of ovarian cysts I obtained as a rule such a precipitation that the whole was entirely, or almost entirely, or at least to a great extent, transformed into a solid mass. There is only one case (xxiii.) in which the coagulation was slight in spite of addition of a drop of acetic acid. It may be that, in regard to coagulation, ovarian fluid differs from that of cysts of the broad ligament. In the first case of cyst of the broad ligament occurring in the list, this point was not examined, but of the two following, in case xi. no coagulation at all took place by mere boiling, and in case xii. it was very slight. In both coagulation appeared after the addition of nitric acid. In a case of a small cyst of the parovarium from a patient from whom Dr. Thomas removed a multilocular ovarian cyst from the other side, I found likewise no trace of coagulation by mere boiling, some with nitric acid, and much more with acetic acid.

The redissolution of the coagulum by boiling with excess of acetic acid, which should give us a means of recognizing ovarian fluid, has not proved reliable in my hands. I have used

¹ L. c., p. 84.

this test from operative case xv., and tapped case x. in every instance. In most cases the coagulum has, indeed, been more or less completely redissolved, but not only in operative cases xvii. and xviii. where there was much blood, but in operative cases xix., xliii., and xlvi., where there was scarcely any, it remained more or less completely unchanged. In operative cases xl. and xlv., it was only partly gelatinized.

On the other hand, the coagulum was more or less completely redissolved in tapped cases which were decidedly not cystic, but came from ascites with cirrhosis of liver (xxiii.), ascites with cancer of the omentum (xxvii.), ascites from unknown cause (xxix.).

There is a property which I do not find mentioned anywhere, which seems to have some really practical importance, and is intimately related to the chemical composition of the fluid. I mean its power of resistance to decomposition. Ovarian fluid has a wonderful capacity of keeping. It not only in a great measure retains its general appearance for a long while, but even the microscopical elements of which we are going to speak are often preserved for a very long time. Thus I re-examined, September 6th, the fluid of case xv., operated on May 15th, making an interval of almost four months, and found it full of Bennett's large corpuscles, Drysdale's small corpuscles with the shining granules, and columnar epithelial cells. In case xvi. the fluid, sixteen days after operation, had an offensive odor, dirty green color, and, nevertheless, it was found full of Bennett's corpuscles, Drysdale's corpuscles, columnar epithelium, and finely granular bodies with or without nucleus. In case xii., which was a cyst of the broad ligament, I repeated the examination four months and one week after the operation. The fluid was still clear, but from colorless had become orange-colored, offensive, and no elements were recognizable except a few granules bound together by a clear mass, and cholesterin. In another case the fluid, twenty-one days after operation, did look unchanged, but contained no traces of anatomical elements, nor bacteria. Ascitic fluid becomes turbid, and all elements are destroyed within a few days. In tapped fluid xiv., where my diagnosis of ascites with cancer was corroborated by laparotomy, the next morning very few elements were preserved, and the third, they were all gone. In

another case of simple ascites, ten hours after operation all epithelial cells were highly disintegrated, and next day no morphological elements were visible.

The test-tube and the spectroscope having failed to give us a means of diagnosing ovarian cysts, and the physical characters giving only a more or less vague information, we will examine what the microscope can do.

Formed elements.—When a man for the first time looks at a drop of ovarian fluid through a microscope, he is perfectly bewildered by the number and variety of bodies he sees. When I began this study I was entirely unprejudiced. I did not take anything for granted. I had only seen that equally good men had come to diametrically opposite views on the diagnostic value of the fluids drawn from abdominal cavities, and I began, therefore, to study the fluid as if there never had been written anything on the subject. I had not even a nomenclature. I drew carefully what I saw, and described it so as to be able to recognize it. Later I made a careful study of what had been published on the subject, both in America and in Europe.

In the course of my study of the fluids themselves, I soon came to the result that all these many bodies we see in the microscope can be reduced to a few types. It is only by studying the cyst-walls, and especially by tracing the formation of cysts back to its very beginning, that we can come to understand the fluid contained in the cysts. Furthermore, the fluid ought always to be examined as soon as possible, for although it may often be recognized, as we have seen, after months have elapsed, still the elements undergo some change. The larger bodies break down to granules, and movement is arrested.

All the bodies seen in ovarian fluid are red blood-corpuscles, epithelial cells, nuclei, granules, pigment, finely granular globular bodies like lymph-corpuscles, or colorless blood-corpuscles, pus corpuscles, spindle-shaped cells, cholesterin, and indican.

Red blood-corpuscles are usually found. Sometimes they are so numerous as to be the preponderant element; in other instances they are few in number; and in some I have not found them in the specimens examined (operative cases xxiii., xxiv., xxviii., xxx., xxxv., xxxviii., xl., xliii., xlv., xlvii., lv.),

which of course is no proof that they were totally absent from the fluid, but it shows at least that they were rare enough not to be present in every drop of it. We cannot see by the color of the fluid if there are blood-corpuscles in it or not. A fluid may be light-colored and contain a large number in every visual field, and on the other hand it may be dark-brown and not show a single red blood-corpuscle (operative case xxiv.). Then the color is due to pigment in the shape of granules, or of larger, irregular masses, or inclosed in the dark variety of Bennett's corpuscles. The red blood-corpuscles appear with somewhat different shapes (see Fig. 1).

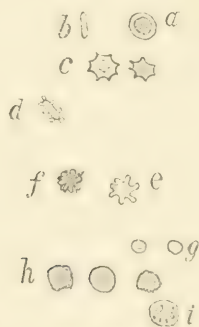


FIG. 1.—Red Blood-Corpuscles.

a, front view (7 to 9 μ in diameter)¹; *b*, side view; *c*, crenated; *d*, same in side view; *e*, rosette-shaped; *f*, thorn-apple-shaped; *g*, hematoblasts, probably young red blood-corpuscles²; *h*, large red blood-corpuscles, without any distinction between centre and rim, some round, some slightly angular, some slightly serrated; *i*, red blood-corpuscle a day after operation, showing granules, recognizable by its color.

Epithelial cells are almost constantly found. When they are seen in front view (Fig. 2), they are more or less angular, varying in size from 11 μ to 34 μ . Some of them have a nucleus which may be considerably enlarged, others have none; but all contain finer or coarser granules due to fatty degeneration. Sometimes they are found in groups (Fig. 3). As a rule, they present themselves also in side view (Fig. 4), and then we see

¹ μ = micromillimetre, or one-thousandth of a millimetre. All the figures are magnified 400 times.

² Louis Elsberg: *The Structure and Other Characteristics of Colored Blood-Corpuscles*. Reprint from the *Annals of the New York Academy of Sciences*, vol. i., Nos. 9 and 10, New York, 1879, p. 14.

that they are columnar.¹ The nucleus, if there is any, has not a constant place near the lower end as in the fresh cells observed in young cysts, but is sometimes found midways, sometimes even near the upper end. This upper end is sometimes straight, sometimes convex, sometimes divided in fibrillæ. The lower end is always thinner, and ends usually in a small root.

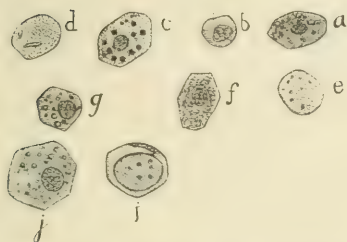


FIG. 2.—Epithelial Cells in Front View.

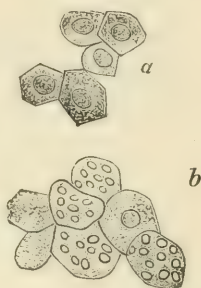


FIG. 3.—Groups of Epithelial Cells.

When the fatty degeneration reaches a high degree, the epithelial cells appear as so-called *gorged*, or *Bennett's corpus-*

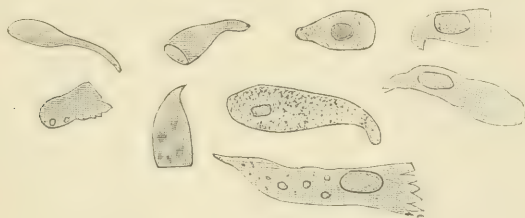


FIG. 4.—Columnar Epithelial Cells in Side View.

¹ It is strange that these cells are much oftener seen in front than in side view, although one would expect the contrary in bodies which have their greatest dimensions from top to base. Perhaps it is due to the greater compactness of the lower part distinctly observable in the cells, as long as they are young. Malassez and De Sinéty say (*Archives de Physiologie*, 1881, p. 227) they have occasionally found flat epithelial cells both in the fluid and on the walls. I have never found this, nor has Waldeyer, and I take it to be a diagnostic point of the greatest importance that ovarian tumors invariably are lined with columnar epithelium.

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cles (Fig. 5). These are large granular cells, varying in diameter from 16 to 39 μ , roundish, or angular (*i. e.*, globular, or polyhedral), sometimes regularly pentagonal. They are more or



FIG. 5.—Bennett's Large Corpuscles, or Nunn's Gorged Corpuscles, *i. e.*, Epithelial Cells in Fatty Degeneration.

less filled with dark or shining granules. The shining granules are much larger than in the fatty nuclei we soon shall speak of. Sometimes a clear rim is found near the contour, and sometimes a nucleus is seen in the interior (Fig. 6.)

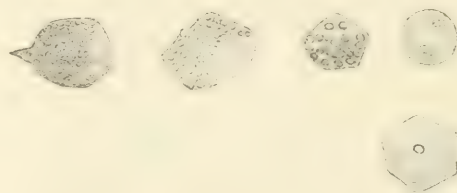


FIG. 6.—Transition from Epithelial Cells to Bennett's Corpuscles.

At other times one or more vacuoles are found in the epithelial cells (Fig. 7).

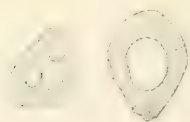


FIG. 7.—Epithelial Cells with Vacuoles.



FIG. 8.—Fragments of Bennett's Corpuscles.

This seems to be a kind of disintegration which will lead to their destruction, as we find it represented in Fig. 8.

Often we find a clear globule pushed out from the circumference (Fig. 9), and drawn in again shortly after. Perhaps such a globule sometimes becomes detached, and begins a separate life. At least these globules are entirely like some of those we find in the fluid, entirely structureless globular bodies, 11 to 16 μ in diameter, which may be called colloid corpuscles (Fig. 10).



FIG. 9.—Epithelial Cell with Appendix.

These are probably the same which Malassez and de Sinéty¹ call hyaline bodies; they say that they have been able to follow them into the interior of goblet-shaped cells, and hold them therefore to be products of secretion. They think that these small masses are fused together and form larger ones. Some of them they pretend can be seen with the naked eye, and are half a millimetre in diameter. I have never seen anything of the kind, and as they base their description on hardened fluid cut into sections, or at least on fluid stained with picro-



FIG. 10.—Colloid Corpuscles.

carmine, these bodies may be artefacts due to the effect of the chemical reagents employed. All my descriptions are based on observation of entirely fresh fluid without the addition of anything. I have also made sections of hardened fluid, but I have not found the bodies described by the named French authors.

There is another kind of colloid masses which I occasionally have seen. These are large, irregular, and have very fine

¹ L. c., p. 234.

opaque granules (Fig. 10, *b*). I take them to be altered epithelial cells.

There is also found a kind of bodies which Eichwald called *horn-cells* (Fig. 11); they are polyhedral, have sharp ridges, and look horny. Waldeyer¹ doubts their existence, and for a while I did so too. They might as well be some kind of accidental admixture; but in the first place they are found very commonly and, secondly, I once found (operative case xxiii.) three columnar epithelial cells sticking together, which were in a state of transition to horn-cells. The shape was yet visible, but the protoplasm was gone.



FIG. 11.—Horn-cells.



FIG. 12.—Ciliated Pus-corpusele.

In none of my cases did I find *ciliated* columnar epithelial cells in the fluid, but in case vi. it contained ciliated pus corpuseles (Fig. 12), which can only be produced from a surface covered with ciliated epithelium. In the scrapings from the inner side of the cyst were also found numerous true columnar cells with cilia, as represented in Fig. 13.

According to Olshausen,² ciliated epithelium is characteristic of cysts of the parovarium, but in this case the tumor was not intraligamentous, and the tube was not even removed. It has also been pointed out³ of late that parts of the paro-

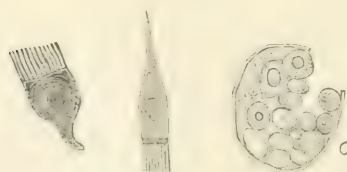


FIG. 13.—Ciliated Epithelial Cells.



FIG. 14.—Proliferating Cells.

varium extend normally into the substance of the ovary, by which a possibility is afforded of the formation of a cyst, lined with ciliated epithelium, in the ovary, as in my case (com-

¹ Archiv für Gynäkologie, i., p. 270.

² Olshausen, l. c., p. 51.

³ Fischel in Archiv für Gynäkologie, 1879, Vol. xv., p. 215.

pare case li., a multilocular ovarian cyst with ciliated epithelium and watery fluid, which will be described separately, p. 43).

In a few cases (i., iv., x., xv., xvi.) I have found cells in proliferation (Fig. 14).

I admit that *a* (from case i.) might be due to a mere conglomeration of different bodies and impending breaking down of an epithelial cell, but not so with *b* and *c* (both from case xv., cystic myxo-fibroma); *b* presents very distinctly a large cell, with four large finely granular nuclei in the interior, and one with a nucleolus, forming a bud at the periphery. In *c* a distinct cell-membrane is visible. It is burst and the interior is full of bodies, of which some are already well-developed cells, while most of them still retain the character of granulated nuclei.

In quite fresh fluid it is not rare at all to find the epithelial cells surrounded by arms of cement substance, which constantly



FIG. 15.—Large Amœboid Bodies from Secondary Cyst.

change shape. I have seen this in cases x., xxi., and xxii. Besides this, in case x. I observed, both in the main cyst and in a secondary cyst, large *amœboid bodies*.

In Fig. 15 we see such a body represented in three consecutive shapes. In *a* we see two epithelial cells just connected by a narrow bridge. In *b* another bridge has been formed at the lower end, and the middle is taken up by a clear vesicle. In *c* the upper connection has extended to the full width of the two composing parts, the vesicle occupying the lower half of the whole body. The difference in the distribution of the solid parts in the different stages is also clearly shown.

Fig. 16 represents three epithelial cells from the main cyst, sticking together, changing shape and relative position, in three consecutive stages. The shining granules changed in

regard to place and number. Sometimes they were comprised within one of the prolongations sent out from the main body. In *c* the intermediate cell has moved down, and the two other ones have come in contact. Fig. 17 represents a cell of the same kind in a more advanced stage of fatty degeneration, a Bennett's corpuscle, the rim of which was possessed of amœboid movements.

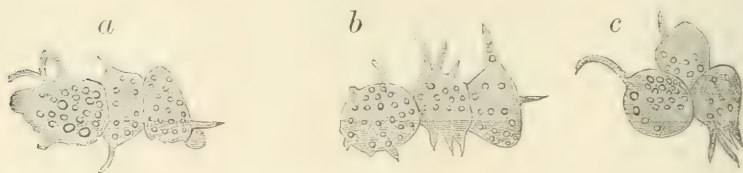


FIG. 16.—Three Epithelial Cells, with Amœboid Movements, from Main Cyst.

I found also *small* cells of the same kind with a few shining granules (Fig. 18). They were only 11 to 13 μ in diameter without the offshoots.

Finally, I found bodies exactly like colorless blood-corpuscles, with or without a nucleus, moving about and changing shape like those we find in ascites.



FIG. 17.—A Bennett's Corpuscle Possessed of Amœboid Movements.



FIG. 18.—Small Amœboid Epithelial Cells.

All these amœboid corpuscles were only found in a single case, and have never been described by any one else. This was written in the early part of the summer of 1880, and the discovery was made April 3d, 1880, a year before Malassez and de Sinéty published their description of the fluid of ovarian cysts (*Archives de Physiologie*, 1881, second number). At page 233, they describe similar bodies under the name of "stellate and anastomosing cells." The only difference is that their cells each show a nucleus, which was not visible in mine, except in a transformed condition in Fig. 17. On the other

hand, theirs have not the large granules changing places and the network of threads uniting them in Fig. 15, *a*. They take them to be, not epithelial cells, but connective tissue cells. The difference in appearance is easily explained by my examination having been made on the living, moving cells, while they treated theirs with chemical agents which brought the nucleus in view. The discovery of amœboid cells is of importance, because the presence of amœbæ has been made a chief criterion by which to distinguish ascitic from ovarian fluid.

Besides red blood-corpuscles and epithelial cells in various kinds and degrees of metamorphosis, we find in ovarian fluid small bodies which are commonly known in this country as *Drysdale's corpuscles* (see Fig. 19). These are small, round-



FIG. 19.—Drysdale's Corpuscles, *i. e.*, Nuclei in Fatty Degeneration.

ish or slightly angular (*i. e.*, globular or polyhedral) clear bodies with a small number of shining granules placed at some distance from one another. They have no nucleus, nor does any appear on addition of acetic acid. Their size ranges from a little below a red blood-corpuscle to a little above a pus-corpuscle. These bodies are so well characterized by their shining granules that I do not find any difficulty in distinguishing them from ordinary pus-corpuscles. On the other hand, they cannot be distinguished from Lebert's *pyoid bodies*¹ by acetic acid, as recommended by Dr. Drysdale, for this is the very test indicated by Lebert for his bodies. "They have no nucleus," says he, "and acetic acid, although it makes them a little more transparent, does not affect them." His drawings of them are also identical with Drysdale's, but he says that he found these bodies in the peritoneum, in the synovial membrane of the knee, in congestive and metastatic abscesses, and often mixed with common pus-corpuscles, both in extravasations and in the false membranes on mucous and serous membranes.

¹ Lebert: *Physiologie Pathologique*, Vol. i., p. 46, and *Atlas*, Plate ii., Fig. 2, Paris, 1845.

Another test has been indicated by which Drysdale's corpuscles are to be distinguished from Bennett's. Ether is said to dissolve the latter, while the former remain nearly unaffected by it, or at most have their granules made paler.¹ I have found ether a difficult agent to use for microscopical purposes. If you add it to the object you are looking at, it sets up so strong currents that the bodies are tossed about, and it becomes impossible to follow them. Ether may also be added to the fluid before the cover is put on. Then we see some of Bennett's corpuscles almost dissolved, and large fat globules which probably are formed by extraction of fat and evaporation of ether. But other corpuscles of the same kind are not affected at all, probably because they have not been reached by the ether, which mixes with great difficulty with the colloid fluid. On the other hand, Drysdale's corpuscles are affected in the same way as the large granular cells. They become pale, their contour becomes irregular, their granules disappear, they shrivel and seem to become dissolved. Thus ether affects both kinds of bodies or none at all. Since the one are epithelial cells in fatty degeneration, and the other their nuclei in the same state, as will soon be proved, it is easy to understand that there cannot be any marked difference in the effect ether has on the two kinds of bodies.

I have tried a one-per-cent solution of *osmic acid*. It is said to have the property of staining fat black. I found, indeed, that it made the contour of the granules in Drysdale's corpuscles darker, leaving the clear part unchanged, but I found that it had exactly the same effect on the large granular cell, and gave also the free granules, swimming in the fluid, a black outline. Furthermore, I found that in well-preserved epithelia it stained the outline of the body and of the nucleus, leaving a clear space between the two. Also the contour of red blood-corpuscles became black. Thus this agent is of no use. Either it stains other substances than fat, or else fat is found in all the corpuscles in the fluid.

The only corpuscles in ovarian fluid I have found it really difficult to distinguish from Drysdale's so-called "ovarian granular cell," are thorn-apple or rosette-shaped red blood-corpuscles, the knobs on the surface of the latter, seen from above, giving

¹ Drysdale, Reprint, p. 5.

an appearance which is very like that of the shining granules in the interior of Drysdale's corpuscles. But, by paying close attention, we will find the contour of a rosette-shaped blood-corpuscle scalloped, while that of Drysdale's corpuscles is even.

There is, furthermore, a great variety of small *bodies without nucleus and with fine, dark granules* (Figs. 20, 21, 22, a, b), and some of a similar appearance with a nucleus (Figs. 23

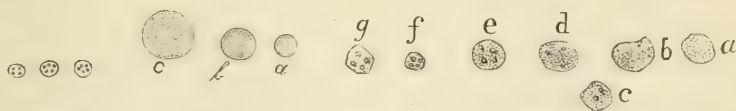


FIG. 20.

FIG. 21.

FIG. 22.

Transition from Nuclei to Drysdale's Corpuscles.

and 24). I hold most of these bodies to be nuclei of epithelial cells, which undergo fatty degeneration. They vary in size from 5 to 16 μ , and attain exceptionally still larger proportions. Some of them are probably colorless blood-corpuscles or lymph-corpuscles. Nuclei may be as large as cells, but on addition of acetic acid the body of the latter is cleared up, and a nucleus appears if there is any.



FIG. 23.



FIG. 24.

Cells with Fine, Dark Granules and Nucleus (Enlarged Colorless Blood-Corpuscles?).

Pus-corpuscles (Fig. 25) composed the whole fluid in case iv., a suppurating ovarian cyst. They were in more or less fatty degeneration. In case xxxviii., the fluid looked also like pus and indeed contained pus-corpuscles, but the majority of bodies could be recognized as ovarian elements. The examination of the wall showed that suppuration had only set in on a small portion, measuring about four centimetres square. In other fluids I have not found anything that especially merited the name of pus-corpuscles, for it must be remembered that these cannot be distinguished from lymph-corpuscles or colorless blood-corpus-

cles, and are, in fact, the same thing. Only when so many of them are produced as to form the greenish-yellow fluid we call pus, can we speak of pus-corpuses. Some pus-corpuses in real pus are not at all dark and filled with protoplasm, clearing up by acetic acid, and exhibiting from one to four nuclei, as they are commonly described and drawn. They may be quite pale, and change very little on addition of acetic acid. Many of this kind were found in case vii., which was a suppurating cyst of the abdominal wall. The size of pus-corpuses is about 11 μ .

Next we find in ovarian fluid all sorts of *granules* of protoplasm, fat, or pigment. If some time has elapsed since the fluid was withdrawn, we find more granules, the larger bodies being gradually disintegrated, but many fresh fluids are also full of them.



FIG. 25.—Pus-Corpuses.

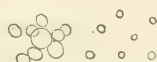


FIG. 26.—Fat-Granules.

Fat-granules are known by their sharp, round contour, and by being highly refracting. The pigment is usually yellow or brown.

In a single case (xv.), in which the wall in many places showed the pretty arrangement of myxomatous tissue interspersed in dense fibrous tissue reaching a thickness of a centi-

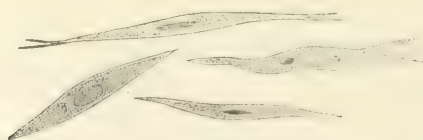


FIG. 26 bis.—Spindle-shaped Cells.

metre, I found numerous *spindle-shaped cells* (Fig. 26 bis). Sometimes the end was split in two or three fibrillæ. Some of them showed an oblong or rod-shaped nucleus. Similar cells were found in parts of the wall. In the same case were found large epithelial cells with vacuoles as in cancer, and large cells with endogenous proliferation (Fig. 14, b, c).

Finally we sometimes find (xxi., xxiv., xxviii., xxx.) crystals of *cholesterin* (Fig. 27), or *indican*, small, angular, solid bodies of a beautiful blue color.

Origin of formed elements. The correctness of the assertion made above, that Bennett's corpuscles are really epithelial cells in fatty degeneration, is proved by the fact that we find all degrees of transition from one to the other in the fluid, as shown in Fig. 6, and still more conclusively by this other fact that, on

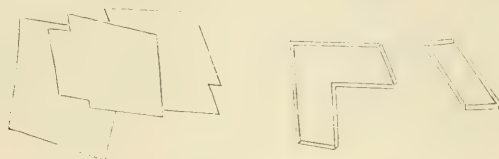


FIG. 27.—Cholesterin.

examining the epithelial lining of an ovarian cyst under the microscope, we again find all these transitions from a comparatively fresh epithelial cell to a well-developed Bennett's corpuscle going on in the epithelial lining itself.

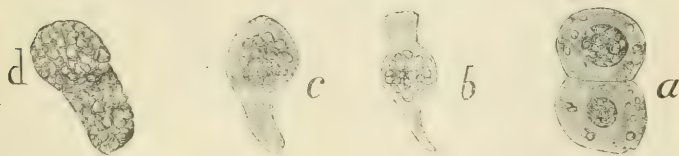


FIG. 28.—Epithelial cells, the nuclei of which are being transformed to pigmented Bennett's corpuscles; *a*, two in front-view; *b*, *c*, two in side-view in different stages of development; *d*, the whole cell is filled with yellowish-green granules; a line in the middle indicates yet the boundary of the nucleus.

The kind seen in Fig. 5, *l*, is composed of dark pigment-granules closely packed together. This pigmented variety is developed in a particular way. The process begins at the nucleus of the epithelial cell which becomes enlarged, dark-colored and coarsely granular. By-and-by it increases so much that it fills the whole cell. I observed all these transitions in a secondary cyst in case xxxi., from which the drawings are taken (Fig. 28).

Sometimes two or three such enlarged epithelial cells with enormously enlarged dark nuclei yet stick together, and then they form such bodies as have been described by Eichwald as "colloid globules inclosing several rounded granulated agglomerations." I have only found these in young cysts, say of the size of a walnut, never in the tapped fluid from large cysts.

The common process of fatty degeneration of the epithelial cell appears first as fine dark granules in different parts of the body of the cell. Later they become larger and clearer, and the cell itself becomes much enlarged. Usually the nucleus is destroyed, but it may still be visible (Fig. 5, *j*).

If instead of examining old cysts we direct our attention to the very beginning of the formation of a microscopic cyst in

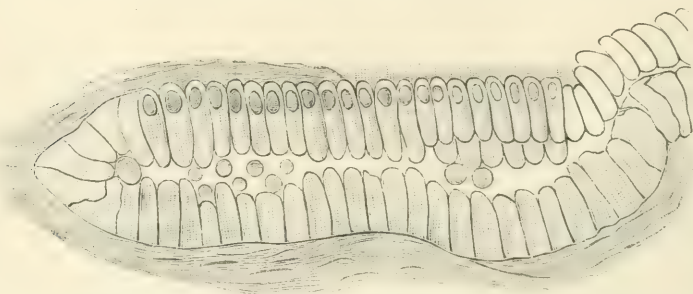


FIG. 29.—Beginning Secondary Cyst-formation.

the centre of one of the epithelial pouches which are developed from the epithelium lining the inside of the main cyst (Fig. 29), we find another process.

The cavity is still so small that the opposite walls almost touch one another, and it contains exclusively colorless bodies without shining granules (Fig. 21, *a*), and corresponding entirely in size and shape with the nuclei seen in the surrounding epithelial cells. They are only 4 to 5 μ in diameter. In another of these minute cysts (Fig. 30), the cavity of which is a little larger, we find also larger bodies, but still of the same kind, without trace of shining granules.

The finely granular bodies are here somewhat larger, either circular with a diameter of 7 μ , or oblong, measuring 7 by 11 μ . One of them has a nucleolus. At the same time we notice

¹ Spencer Wells: *Diseases of the Ovaries*, p. 99.

in the wall a much enlarged epithelial cell with nucleus and nucleolus. This nucleus corresponds perfectly in size and appearance with the bodies swimming in the cavity.

In these minute cysts, then, a melting process is going on by which the bodies of the epithelial cells are dissolved and the nucleoli set free. If we examine young secondary cysts which are large enough to form macroscopical tumors, say of the size of a hazelnut, we may find whole masses of the epithelial lining thrown off and forming flakes in the fluid. In due time these will also be dissolved and their nuclei set free. The nuclei may later undergo fatty degeneration, and then they become Drysdale's corpuscles.

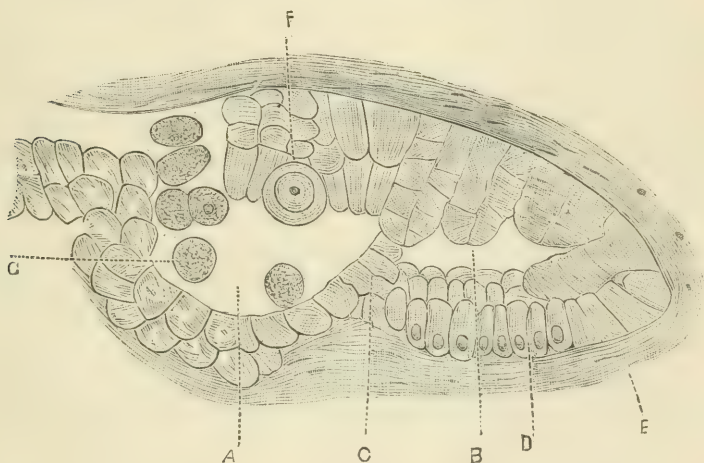


FIG. 30.—Cyst-formation a little more advanced; A, B, two minute cysts partially separated by a ridge C, lined with goblet-shaped epithelium (D); E, connective tissue; F, enlarged epithelial cell; G, finely granular bodies corresponding in size with the nucleus of the large cell.

It will be seen that I do not regard Drysdale's corpuscles, as he does himself, as cells. His first paper is entitled "On the Granular *Cell* found in ovarian fluid," and in the discussion in the American Gynecological Society alluded to above he called it "a cell characteristic of ovarian fluid." I do not see any reason why this corpuscle should be looked upon as a cell, its most distinctive character being never to have a nucleus, while this peculiarity is quite easy to understand when it is itself a

¹ Amer. Gyn. Transact., 1876, vol. i., p. 195.

nucleus. This nucleus is in fatty degeneration, as proven by the clear shining granules in its interior, but this degeneration is first produced in the course of time. In microscopical secondary cysts we never find Drysdale's corpuscles, while we very rarely miss them in the main cyst. It might be asked why Drysdale's corpuscles as a rule are found in much larger number than Bennett's. I believe this is chiefly due to their being nuclei which have greater power of resistance than the cells. The cells easily break down and form the innumerable host of granules we are sure to find in every ovarian fluid. Exceptionally the proportion may be reversed. In case xliii. there were a great many of Bennett's corpuscles and only few of Drysdale's. But whenever there are unusually many of the one, there is a corresponding decrease in the number of the other class.

It appears from the above that I take most of the bodies with fine dark granules, which form so large a part of ovarian fluid, to be nuclei of epithelial cells; but on the other hand several other sources may be indicated from which some of them are likely to derive. Thus, since we almost constantly find red blood-corpuscles in ovarian fluid, we may fairly conclude that there is a corresponding number of colorless blood-corpuscles, say about one for every three or four hundred of the red.¹ Sometimes the wall of ovarian cysts is so crowded with granular cells under the epithelium that it does not seem unlikely that some of them may break through the thin gelatinous barrier and become free inmates of the cavity. Finally the endogenous proliferation we have mentioned above, seems also sometimes to furnish a contingent to the grand army of nondescript granular bodies. Mostly they have no nucleus, which tallies well with the supposition that they are themselves nuclei. Sometimes they have indeed a nucleus (Figs. 23 and 24), but these cells, of rather rare occurrence, are then different from the other bodies, may be they are colorless blood-corpuscles or connective tissue cells, or cells formed by proliferation.

In case xxxii. I observed directly the identity of Drysdale's corpuscles, the colorless bodies with fine dark granules without nucleus, and the nuclei of the epithelial cells. It was the sec-

¹ Funcke: *Lehrbuch der Physiologie*, 4th ed., Vol. i., p. 19, Leipzig, 1863.

and ovary of an old woman of sixty-eight years. One ovary was developed into a large polycyst, the other formed a small tumor about the size of an egg ($5 \times 4 \times 4$ centimetres), with transparent walls, and composed of a few large cysts. The largest, which had formerly been two, as shown by the remnants of the septum, contained a fluid ounce of very thick, colloid, yellow-

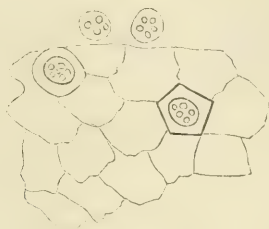


FIG. 31.—Flakes of Epithelium, the Cells melting and setting the Nucleus free.

gray fluid. In this fluid swam flakes of epithelium large enough to be seen with the naked eye. Some of these flakes showed still indistinct outlines of cells, some of which had a nucleus identical with Drysdale's corpuscles in the surrounding fluid (Fig. 31). In other flakes, most cells were no more

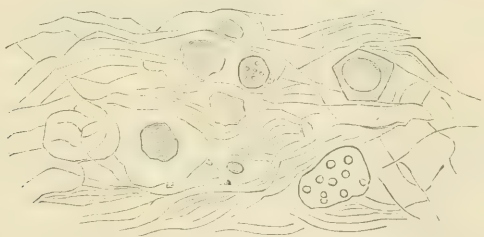


FIG. 32.—Flake of Epithelium, the Cells mostly changed to a Thready Mass with Nuclei.

recognizable as such. They had been dissolved and blended together to a thready mass, with large holes in it. In this mass and in these holes were found nuclei, some of the finely granular semi-opaque variety, others with shining granules, *i. e.*, Drysdale's corpuscles. In a few places the nucleus could yet be seen imbedded in an epithelial cell, or a cell was found

without nucleus, but with large, shining round granules, *i. e.*, changed to a Bennett's corpuscle (see Fig. 32).

The *pigment* which is found as granules, or in larger masses, or incorporated in Bennett's corpuscles is easily referable to the coloring matter found in red blood-corpuscles. In the walls of ovarian cysts we almost constantly find large infarctions of extravasated blood in different degrees of disintegration. When, in the course of time, in consequence of the destruction which is constantly going hand in hand with the new growth in the wall, these strata are opened and carried into the fluid, the pigment swims around in granules or is taken up by cells and incorporated until they become what I have called the dark variety of Bennett's corpuscles. The blood may also be poured directly into the fluid by the bursting of a vessel.

As to the pale, structureless grayish discs which we sometimes find, and which, for want of a better name, may be called *colloid corpuscles*, it is difficult to say what they are. Some of them may be red blood-corpuscles, of which a large amount of the interior contents have been thrown out as described by Dr. Elsberg.¹ Others may be parts of epithelial cells (Fig. 9)

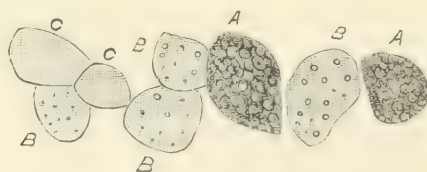


FIG. 33.—Group of Epithelial Cells undergoing various Changes.

AA, Yellow-green Bennett's Corpuscles; BB, Epithelial cells, with a few small, shining globules, and many dark ones; CC, Barely visible, structureless, still angular cells.

which have become separated from the parent body. But most of them, I suppose, are changed epithelial cells. I am led to believe this by having seen whole flakes composed of such bodies, which then, of course, were still more or less angular, and at other times groups, in which some cells exhibited a few fat-granules, others were changed to dark Bennett's corpuscles, and still others were entirely structureless and pale, like the colloid bodies (Fig. 33).

¹ L. c., pp. 48-49.

Thus we see different processes—the fatty degeneration, the colloid degeneration, and the absorption of pigment go hand in hand.

Diagnostic value.—When we look over the above list of anatomical elements, we do not find a single one which is always found in ovarian cysts and nowhere else. In other terms, *there is no pathognomonic morphological element in ovarian fluid*; but it would be a very hasty conclusion if we were to infer that the microscopical examination of the fluid is worthless. When once we know the limits of our knowledge in this respect, we will find the microscopical examination of the fluid a very valuable help; nay, when combined



FIG. 34.—Flake of Peritoneal Endothelium in Mixture of Ovarian and Ascitic Fluid.

with other signs, the character of the fluid is the most conclusive of all that lead us in our diagnosis of an ovarian cyst.

The most important elements are columnar epithelial cells seen in side-view.¹ In front-view they may be so like endothelial cells from serous surfaces that they are difficult to distinguish.

In case xxxix., fluid from a myxoid ovarian cyst had poured into the peritoneal cavity through the opening made in with-

¹I use the expression columnar epithelium as a general term for cells which have greater depth than width. Examined in fresh condition, especially in quite young cysts, we find them goblet-shaped, with the nucleus near the bottom.

drawing a small quantity with an aspirator. Here large flakes were seen which were easily recognized as belonging to the peritoneum, the cells being more roundish and less polygonal than ovarian epithelial cells are when grouped together, and having a nucleus which was much smaller in proportion to the body of the cell (Fig. 34).

But in other flakes the cells had no nucleus, but contained many fat-globules. In this state they become so like Bennett's large ovarian corpuscles that they cannot be distinguished from them. The examination of pure ascitic fluid has led to the same conclusion.

The beginner must be warned not to mistake flat endothelial or epithelial cells seen in side view for columnar epithelial cells. The former are more or less pointed in both ends (see *Liquor Amnii*, Fig. 48), while the columnar epithelial cell is always much wider at the upper end than at the lower (see Fig. 4). Cells which, seen in front view, present a long and narrow surface, may also be taken for columnar epithelial cells in side view, but usually the lower end of these latter is so thin that it forms a small root, and the nucleus is seen much more distinctly than from above, when, as a rule, it cannot be seen at all in the state of more or less advanced fatty degeneration, in which we find the epithelial and endothelial cells swimming in abdominal fluid.

I am surprised to see that Dr. Foulis¹ declares that he has not found epithelial cells in the examination of about eighty different ovarian fluids. I have almost always found them. When we find them, we may conclude that the fluid is contained within a cyst lined with columnar epithelium, and not in a serous membrane like the peritoneum,² nor in a cavity with-

¹ Edinburgh Med. Journal, March, 1875, p. 843.

² Since the ovary is covered with columnar epithelium, the possibility of the appearance of cells of this kind in ascitic fluid cannot be denied, but it has never been found, as far as I know, and the chances of its appearance in a drop of fluid are exceedingly small when we think of the size of the normal ovary and the enormous quantity of fluid often contained in the peritoneal cavity. If the ascites is combined with an ovarian cyst, the chances of the appearance of columnar epithelial cells in the ascitic fluid, even without rupture, by mere abrasion from the surface of the enlarged ovary, would be considerably greater, but in the only case of the kind I have examined (operative case xxv.), the ascitic fluid contained only flat endothelial cells.

out epithelium, as some uterine fibro-cysts, but we cannot conclude that it is ovarian. It may as well be a cyst of the broad ligament or, perhaps, dropsy of the Fallopian tube. If the epithelium be ciliated, this will not help us, for cysts with this variety of epithelium are found in the ovary, as we have seen above (p. 20), and, on the other hand, cysts of the broad ligament may have columnar epithelium without cilia (case xi.).

Bennett's corpuscles have no diagnostic value, not even to distinguish cysts from other cavities. I found them in two of my cases of cysts of the broad ligament (operative cases xi. and xii.), in a case of a cystic, cancerous tumor of the abdominal wall in a man (operative case xxvi.), in a case of cancer of the peritoneum (tapped case xiv.), where my diagnosis, based alone on the characters of the fluid, was confirmed by laparotomy. Likewise, in tapped cases i. and ii., the first of which was cancer of the peritoneum, as ascertained by operation and autopsy by Dr. H. K. Bennet, of Fitchburg, Mass., and the second, a tumor in the abdominal wall of a man. These corpuscles seem also to be exactly like those described under quite different circumstances by Gluge, and later by Paget,¹ who takes them to be altered lymph-cells.

Epithelial cells, in which some degree of fatty degeneration is found, but not enough to constitute Bennett's corpuscles, I have found in a case of ascites from cardiac and renal disease (tapped case iii.).

On the other hand, I missed Bennett's corpuscles in one case of ovarian polycyst (operative case xxvii.).

Drysdale's corpuscles seem to have a little more value than Bennett's, but they are by no means pathognomonic, not even of the presence of any kind of cyst, and still less of an ovarian cyst. I have found them in one of my cases of cyst of the broad ligament (v.), in a case of suppurating cyst of the abdominal wall (vii.), in the above-mentioned case of cancer of the peritoneum (tapped case i.), in a case of renal cyst (tapped case xxxii.), in a congestive abscess extending from the spine to the femur (tapped case xxxiii.), and in a vaginal cyst.

Similar observations have been made by others. Dr. A. Erich, of Baltimore, has found these corpuscles in a case of

¹ Paget: *Lectures on Surgical Pathology*, 3d ed., London, 1870, p. 283.

encysted ascites.¹ The diagnosis of "the ovarian cell" had been made by Professor Brown, "a microscopist of experience." They were likewise declared to be present by "the microscopist," and by Dr. S. Bunker, member of the committee on Microscopy in the Pathological Section of Kings County Society, in a case of Dr. J. Byrne, of Brooklyn, which turned out to be hobnailed liver with ascites.²

On the other hand, I have missed these corpuscles in cases of simple ovarian polycysts (operative cases vi., xxxvii., xliii., li.), in another where the cyst-wall showed cancerous degeneration (xiii.), and in a case of sarcomatous cyst (xlvi.).

The bodies with fine dark granules which resemble lymph-corpuscles or colorless blood-corpuscles have no significance whatever. I have found them under the most various circumstances: ascites with ovarian cyst (xxv.), ascites with cardiac and renal disease (tapped case iii.), ascites from nephritis (tapped case xii.), ascites with cirrhosis of liver (tapped case xxiii.), ascites from cancer of the peritoneum (tapped cases i., iv., xiv., and xxvii.), abdominal tumors in men (operative case xxvi., and tapped case ii.), in a cyst of the broad ligament (case xi.), in hydrocele fluid (tapped case xiii.), and in fluid drawn from the thoracic cavity (tapped case ix.), in a congenital cyst of the neck (tapped case xxi.), and in a renal cyst (tapped case xxxii.).

Cholesterin is frequently found in other old collections. I have found it in a case of a tumor of the abdominal wall in a man (tapped case ii.), and in an old congestive abscess of the femur (tapped case xxxiii.).

Waldeyer³ and Spiegelberg⁴ say that amœboid bodies are never found in ovarian fluid, and always in ascites. We have above mentioned a case of ovarian fluid (x.) in which all sorts of amœbæ were found. Thus not even this rule is without exception.

After having thus conscientiously stated what I have found to be the fact: that no element is characteristic for myxoid ovarian fluid in the sense as a single hooklet is characteristic

¹ Erich in Boston Medical and Surgical Journal, vol. ciii., pp. 318-320.

² Brooklyn Proceedings, 1878, vol. iii., p. 323.

³ Archiv für Gynaekologie, vol. i., p. 272.

⁴ Volkmann's Vorträge, No. 55.

for a hydatid, I must still say that it is my conviction that in the great majority of cases we can decide if a supposed tumor is ovarian or not. We have found exceptions from all rules; but, on the other hand, it is extremely unlikely that a case should present a mere combination of exceptions. By examining *all* the characters discussed in the preceding pages, by combining the physical, chemical, and microscopical properties, and weighing one against the other, and, most of all, by *taking the signs found in the fluid together with the other features of the case*, we can almost always come to a correct result. It would be unwise to rely on the characters of the fluid alone. We do not act thus with the other signs. We do not restrict ourselves to palpation, or percussion, or auscultation, or the use of the uterine probe, or to the history of the case. We take all points together, and the same ought to be done with the characters of the fluid. Nobody ought to open an abdomen only because a microscopist, be he ever so expert, declares a fluid to be ovarian; but when other things point in this direction, very valuable information may be obtained from a careful examination by an experienced observer.

When I said just now that we almost always can come to a correct result, I mean to say that cases like those of Byrne, Erich, and H. K. Bennett probably can be avoided. *As to cysts of the broad ligament, I do not know of any character by which they can be distinguished from ovarian.*

History.—In 1846, John Hughes Bennett¹ described a case of ovarian tumor: “The fluid contained flocculi composed of numerous cells, varying in size from one one-hundredth to one-fortieth of a millimetre in diameter. The great majority were about one-fiftieth of a millimetre. They were slightly granular, of round and oval shape, unaffected by water, but becoming more transparent on the addition of acetic acid, and exhibiting a distinct nucleus about one one-hundred and fortieth of a millimetre in diameter. The nucleated cells were imbedded in a granular matter which could easily be broken down.” This description applies exclusively to the *large* bodies we find in ovarian fluid. He did not notice any of the nuclei which are so important a part of this fluid, and the statements, that the bodies were *slightly* granular, that they contained a nucleus,

¹ Edinburgh Med. and Surgical Journal, 1846, vol. lxx., p. 279.

and were imbedded in a granular matter, apply only to some of these corpuscles, whilst others exhibit quite different characters, as shown above. But imperfect as the description is, it is clear enough to enable us to recognize the bodies the author describes, and, as he is the first who has done this, I have in this paper throughout called these large bodies *Bennett's bodies*.¹

In his clinical lectures on the "Principles and Practice of Medicine" (second edition, New York, 1858, p. 91, Fig. 70),² Bennett draws both large granular cells with or without a nucleus, and *small bodies invariably without a nucleus*, which latter are *entirely like Drysdale's corpuscles*. Fig. 172 on page 172 shows very distinctly Drysdale's corpuscles, *after addition of acetic acid*, without nucleus. The text describes them as "pale, round and oval corpuscles, the outline of which becomes stronger on the addition of acetic acid." Thus there is no doubt that Bennett has known these bodies, but he does not claim that they are characteristic for ovarian cysts.³

¹ I do not think Gluge ought to have the place accorded to him by several authors. It is true that as early as 1839 he described and delineated some bodies which he called *compound inflammation-corpuscles*, and that in his *Atlas of Pathological Histology* (translated by Joseph Leidy: Philadelphia, 1853, p. 67) he says that in a case of ovarian cysts the fluid contained these corpuscles. But when we examine what he means by his compound inflammation-globules (*Anatomisch-mikroskopische Untersuchungen zur Pathologie*. Minden u. Leipzig, 1839, plate i., fig. i., 2, text p. 12), we find that it is something utterly different from the bodies found in ovarian cysts, and first described by Bennett. Gluge's compound inflammation-globules are, during the stasis caused by inflammation, observed in the capillaries, and are red blood-corpuscles which lose their membrane and their color. The nuclei [*sic*] only remain, and are bound together with a whitish cement, so as to form dense, opaque round heaps of globules. By pressure, or by acetic acid, these heaps are disintegrated and the small globules separated. During a later stage, the capillaries burst, and the compound inflammation-globules are found in the parenchyma of the tissue. Nowadays we do not admit the presence of any nucleus in the red blood-corpuscles of man, but whatever Gluge's globules may be, they are not what we have seen Bennett's corpuscles to be, viz., changed epithelial cells.

² The first edition was published in London in 1852. Through the courtesy of Mr. Geo. Bullen of the British Museum, I am informed that Fig. 70 of the second edition is found as Fig. 89, on page 218 of the first edition, and Fig. 172 of the second edition as Fig. 92, on page 219 of the first edition. Thus it is proved that Bennett has known these bodies before Beale's first edition was published (1854).

³ Atlee thought it necessary to defend his and Dr. Drysdale's priority

In 1857, Lebert¹ made the important statement that he "had always been able to trace all intermediate degrees between the epithelial cells which he found in the fluid changed or infiltrated with fat-granules or constituted by simple nuclei, and those epithelial cells which, on the internal surface of the cysts, form a beautiful lining, the cells of which by juxtaposition get a polygonal aspect." Plate xxxv., Fig. 8, gives a poor representation of what he calls *granular bodies* of ovarian cysts. They are neither like Bennett's nor Drysdale's corpuscles.

Lionel S. Beale described only the two kinds of bodies which Bennett had already delineated and described, and his drawings are small and indistinct,² but his description was somewhat more precise. He describes: "1. Small, delicate, transparent, and faintly granular bioplasts, without the slightest appearance of a nucleus, some being somewhat larger, and others smaller than a pus-corpuscle. 2. Large bodies, often as much as one one-thousandth inch [= 25 μ] in diameter, but varying in size, of a dark color by transmitted, and white by reflected light. These, which have been termed "granular corpuscles, compound granular cells, inflammation-globules, etc., are aggregations of oil globules in a cell-form." It is strange that he calls the small bodies *faintly* granular, for the granules are shining and well marked in those of the nuclei which correspond with Drysdale's corpuscles. Nor does he state that these granules, as well as those in the large cells, are oil globules, only of smaller dimensions and always separated from one another. His expression, that the large bodies are agglomerations of oil globules in *cell-form*, does not contain any information about their origin.

By far the most thorough description of ovarian fluid existing is that published in 1864 by *Eichwald*, and to a great extent reproduced in Spencer Wells' classical work. He gives against Dr. Waldo J. Burnett, who claimed to have found the ovarian cell before them, and described it in his paper on "The Cell" in the Transactions of the American Medical Association in 1853. By referring to Dr. Burnett's paper, I find that he has no claim whatever to priority in this question, and that most of what he says on ovarian cysts is wrong.

¹ *Traité d'Anatomie Pathologique*, vol. i., p. 245, Paris, 1875.

² Beale: *The Microscope in Medicine*, fourth edition, Philadelphia, p. 270, and Plates xxx., Fig. 6, and xxxvii., Fig. 7. The same is already found with immaterial differences in the first London edition, 1854.

much better drawings, and for the first time a rather complete list of all the morphological elements. He was the first who described the transformation of epithelial cells to Bennett's corpuscles, which he calls granule-heaps (Körnerhaufen). He gave also an excellent description of bodies which, he says, were entirely like Lebert's pyoid bodies. "They had a dark contour, and a clear centre which contained a different number of extremely fine black dots, but sometimes also a few larger, highly refracting granules." The former are what I have described as finely granular bodies, and the latter are Drysdale's corpuscles. Both are, as I have pointed out, nuclei of epithelial cells. He is also the first who speaks of colloid globules, horn-cells, cholesterin, and pigment. But after giving Eichwald full credit for his entirely original work, we cannot withhold some criticisms. Thus, he states, p. 385, that the small secondary cysts were lined with *flat* epithelium. This is a mistake. It is always columnar or, perhaps, rather goblet-shaped, as is easily ascertained as often as the cells are seen in side view. Secondly, he mixed water with the fluid, which probably explains the many queer things he has seen, especially in regard to colloid globules, and which are reproduced on pp. 97 to 100 of Spencer Wells' work. Finally, Eichwald has still by far too many categories, which render his description obscure.

Nunn does not merit the distinct place in the history of ovarian fluid sometimes allotted to him in text-books. He mentions only the "large cells gorged with granules,"¹ which others had described before, and not the small body with shining granules; but the term *gorged* is a good one, and might be retained by those who object to the use of the discoverer's name, to designate natural objects. It points to one difference, among others, between Bennett's and Drysdale's corpuscles, the latter never becoming gorged. But on the other hand, there are many Bennett's corpuscles in which the fat-globules are pretty far apart.

In 1870, Waldeyer wrote his excellent article on Epithelial Tumors of the Ovaries.² He does not mention the nuclei with the shining granules which had been well described by several

¹ Baker Brown, l. c., p. 47.

² Archiv für Gynäkologie, i.

of his predecessors, but, on the other hand, he is the first who not only pointed out the presence of well-preserved columnar epithelial cells, but added that this was the most noteworthy element, a sentiment in which I entirely agree with him.

A historical sketch, be it ever so brief, would be unjust if it did not mention Spiegelberg. Although he has not discovered any of the elements of ovarian fluid, he has been one of the first to point out the diagnostic value of the examination of the fluid, and has repeatedly come back to the subject¹ with increased experience and unshaken confidence, but he has only had the distinction of ovarian fluid from ascites in view, and his assertions, as we have demonstrated above, are a little too positive.

Having spoken in such detail of the commonest kind of ovarian cysts, we can be brief in treating of the rarer varieties.

3. Dermoid Ovarian Cysts.

We find three dermoid cysts on our list (operative cases ii., xix., xxii.). None of them were of the pure classical type, consisting of a monocyst filled with fat. They were all combined with myxoid cysts. In case ii. was found one compartment filled with a thick yellow fluid, like pea-soup, that could scarcely pass through Emmet's canula, which has a calibre of about five or six millimetres, smelt very offensive, and soon formed a solid tallow-like mass. Besides, this cyst contained a mass of long, rolled-up hair. But from other compartments came a much thinner fluid, which, although it was rich in coarse and fine fat-globules, contained columnar epithelial cells (Fig. 34 *bis*) and nuclei with shining granules.

In case xix., both ovaries formed polycysts, the greater part of which had the character of myxoid cystomas, but others had skin-like walls, and contained hairs. From some came a fluid, which in no respect differed from that found in most myxoid cystomas, except that the coagulum formed by boiling remained unchanged by boiling with an excess of acetic acid. It contained small, finely granular nuclei (Fig. 20), a few nuclei with shining granules (Fig. 19), groups of columnar epithelial cells with nucleus, others with shining globules

¹ In *Monatschrift für Geburtskunde*, vol. xiv., 1859, and vol. xxxiv., 1869; *Archiv für Gynäkologie*, vol. i., 1870, vol. iii., 1872, vol. vi., 1874; *Volkmann's klinische Vorträge*, No. 55, 1875.

(Fig. 3, *b*), a few red blood-corpuscles, cells with the type of colorless blood-corpuscles (Fig. 23), and cholesterin. Finally, some compartments contained, mixed with this fluid, large masses of liquid fat swimming in a watery fluid.

Case xxii. was a multilocular cyst, containing cartilage, bone, and teeth. Three large compartments were emptied



FIG. 34 bis.—Epithelial cells in fatty degeneration, from myxo-dermoid ovarian cyst.

during the operation, and contained all the same kind of fluid. Then there was a large solid mass containing small cysts. The fluid had a peculiar appearance, being full of small shining scales, which formed clouds in a more translucent fluid. As in the preceding case, the fluid coagulated almost entirely by boiling, and the coagulum was not affected by boiling acetic acid. The microscope showed that the field was crowded with

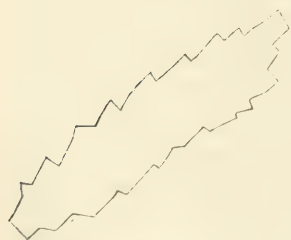


FIG. 35.

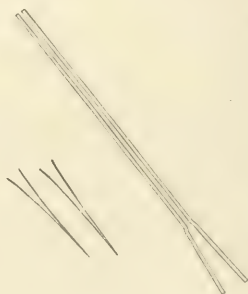


FIG. 36.

FIG. 37.

Rare forms of cholesterin (?).

cholesterin, which formed the fine shining scales seen with the naked eye swimming in the fluid. Besides the common forms (Fig. 27) were seen pieces with teeth, like the blade of a saw (Fig. 35), or needles (Fig. 36), or tubes (Fig. 37), composed of a long part with parallel walls and a short coniform part. All these were composed of the same colorless transparent mate-

rial. If these two latter forms are not cholesterin, I suppose they are some other kinds of fat crystals. Furthermore were found large columnar epithelial cells, some fresh, others in more or less fatty degeneration (Fig. 39); some Bennett's corpuscles, exceedingly few nuclei with shining granules, and epidermal scales. The latter are easily distinguished from the epithelial cells by being flat and without any nucleus.



FIG. 38.

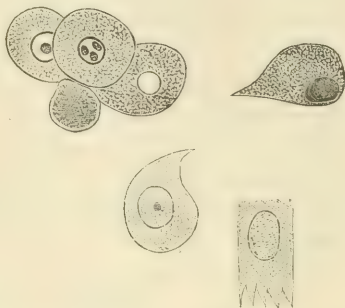


FIG. 39.

FIG. 38.—Epidermal Scales from Myxo-dermoid Ovarian Cyst.

FIG. 39.—Columnar Epithelial Cells from Same, two of them filled with Yellow Fat.

If now we ask what information, as to diagnosis, would be gained by examining the fluid, it appears that much is left to chance. If a single hair was found, or, if the fluid consisted of melted fat, or contained epidermal scales, it would be sure that it came from a dermoid cyst, but we could not tell that this was situated in the ovary. On the other hand, a fluid like that comprised in a great part of cases ii. and xix., and showing columnar epithelial cells would prove that the tumor was ovarian, but not that it was dermoid.

A fluid like that of case xxii., which contained at the same time columnar epithelial cells and epidermal scales or hair, is the only one which enables to make the complete diagnosis of dermoid cyst of the ovary.

4. *Multilocular Ovarian Cyst with Watery Fluid and Ciliated Epithelium.*

Case li. is so peculiar that I must make a class apart of it. The fluid was first sent to me by Dr. Bozeman for diagnostic purposes. It was almost colorless, slightly opalescent,

not viscid, reaction alkaline, specific gravity 1013. No spontaneous coagulation. On boiling, very slight coagulation, a little more after adding a drop of acetic acid, still more with nitric acid. The fluid, which had become turbid by boiling with a drop of acetic acid, became clearer by boiling with an excess of the same reagent. The microscope revealed great scarcity of elements. It contained many isolated small oil-globules, some large globular bodies, composed of the same (Fig. 40), some empty epithelial cells (so-called horn-cells), and a few very pale, small, columnar epithelial cells seen in front view, not a single one in side view, no nuclei with fatty granules (Drysdale's corpuscles). It was, of course, believed by others to be from a cyst in the broad ligament. I made the diagnosis "either cyst of broad ligament or true ovarian monocyst." The operation showed that it was indeed ovarian,

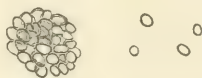


FIG. 40.—Isolated and Conglomerated Oil-globules from clear Ovarian Fluid.

and what surgically is called a monocyst; that is to say, there was one large cyst containing from ten to twelve ounces of fluid, but another cyst in the wall of the main cyst contained half an ounce of the same clear fluid. Besides, there were found in the wall several other cysts of the size of a small walnut. I opened two of these; one contained the same kind of clear thin watery fluid as the main cyst. The other contained a thick cherry-colored bloody fluid, which, under the microscope, showed red blood-corpuscles and a great number of large and small epithelial cells in fatty degeneration; or perhaps some of them were only nuclei.

At the bottom of the main cyst was found a finger-thick solid mass, a development of the ovary. The pedicle was formed by the ovarian ligament, the Fallopian tube, and a part of the broad ligament. It was the right ovary. On the cyst were seen the collapsed compartments which had been tapped some weeks before. Scrapings from the outer surface of the cyst showed large pieces of small polygonal epithelium, which, in side view, was seen to be columnar. This charac-

teristic epithelium was also seen on pieces snipped off with the scissors, and treated with a solution of nitrate of silver. The wall was 4 mm. thick, and composed of the two common layers of fibrous tissue bound together by loose connective tissue. They were very white and so like one another that they could not be distinguished with the naked eye.

Thus it is absolutely certain, both from macroscopical and microscopical examination, that this was a cyst situated in the ovary. Nevertheless, the fluid was watery and limp, and did not contain nuclei with shining globules.

The interior of the main cyst was studded with small protuberances, some of which were a centimetre long. The whole inside of the main cyst, inclusive of the protuberances, was covered with ciliated columnar epithelium. This was too transparent to be seen on the underlying connective tissue, but large pieces were shoved out, and showed the cilia in the most lively movement, both on surfaces seen in front view and on long rows seen in side-view.

This, then, is a very striking illustration of the fact pointed out by Fischel (l. c.) that parovarian elements may develop and form cysts in the interior of the ovary.

As for clear watery fluid with few histological elements, we see that it may be found in the ovary, not only in true ovarian monocysts (hydrops folliculi), but also in multilocular, or at least paucilocular cysts lined with ciliated epithelium.

I have only found one other case (vi.) with ciliated epithelium, and there it was not uniform as here, but mixed with non-ciliated columnar cells. As it was one of my earliest cases, examined at a time when it was my intention to pay attention to the microscopical properties only of cysts, I have unfortunately no notes about the physical appearance and chemical properties of the fluid in that case, but it has probably been thicker, for my notes say that it contained very many of Bennett's corpuscles, both with clear oil-globules and with dark granules.

The fact that here was found a fluid as clear as spring water, in a young cyst not larger than a small walnut, shows that the old doctrine of Virchow,¹ recently reproduced by

¹ Verhandlungen der geburtshülflichen Gesellschaft in Berlin. Vol. iii., p. 218.

Spiegelberg,¹ according to which the cysts with serous fluid are old ones, which formerly had colloid contents, is not applicable to all cases.

5. *Cystosarcoma of the Ovaries.*

I have four cases (ix., xli., xlviii., and xlix.) which, on account of the structure of the wall, I have diagnosticated as cystosarcoma. It would take too much space to describe it here, but I may perhaps discuss it another time. In cases ix., xli., and xlix., the fluid was dark red-brown, like muddy Port wine—a color due to a large quantity of red blood-corpuscles and the pigmented variety of Bennett's corpuscles. Besides, there were seen columnar epithelial cells in front and side view, and nuclei with dark and with shining granules, in short, enough to show that it was an ovarian cyst, but *nothing whatever which indicated a malignant character of the growth.*

In case xlviii., no fluid passed through the canula. It consisted in a jelly-like mass, composed of epithelial cells in fatty degeneration and red blood-corpuscles. If a little of this jelly were drawn out with an aspirator it might be recognized, but nothing would enable us to locate the disease in the ovary, the broad ligament, or the tube unless we found epithelial cells which were undoubtedly columnar, but this was not the case with those I found. A similar jelly has been found by Péan in the peritoneal cavity, in what he describes as *gelatinous disease of the peritoneum.*² In our case it was not the ovary alone which had undergone such a colloid degeneration. Similar masses were found on the peritoneum. In the ovary, the jelly was contained in compartments with exceedingly thin walls, composed of spindle-cells and lined with columnar epithelium.

This latter case corresponds entirely with what Malassez and De Sinéty³ describe as "tumeur kystique par tissu colloïde." Even the absence of layers in the walls had struck me. Cruveilhier designated the disease as "areolar or gelatiniform degeneration," and others as colloid cancer. I do not see any reason to call my case cancer, and since it was evidently

¹ Archiv für Gynäkologie, 1879, Vol. xiv., p. 178.

² Péan: Tumeurs, etc., p. 418.

³ Archives de Physiologie, 1880, p. 871.

malignant, and contained many spindle-cells in the thin walls, I have put it together with the sarcomatous cases.

Malassez and De Sinéty describe also a case of true fibro-sarcomatous cyst¹ like my first two cases.

6. *Cysto-Carcinoma of the Ovaries.*

I have on my list three case of ovarian cysts which are cancerous. In case xiii., cancerous tissue was also found outside the ovary. In case xx., in which the diagnosis of cancer had been made clinically by Dr. Thomas, were found some cells in the epithelial lining, which differed from those found in common ovarian cysts by their prodigious size, some of them reaching 94 by 40 μ . Besides this, epithelial cells were interspersed in the cyst-wall. In case xlii. were likewise found large epithelial cells in the wall, and large masses, composed

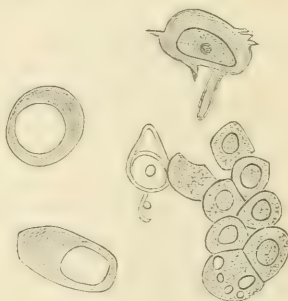


FIG. 41.

FIG. 42.

Isolated and Grouped Epithelial Cells from Cancerous Ovarian Cysts.

exclusively of epithelial cells, without any secondary cyst formation. Besides these, case xxix. showed beginning cancer. The tumor was almost solid, and in some places appeared very large epithelial cells in the wall, reaching 43 by 27 μ .

The only particularity which the fluid presented in all these cases was the uncommonly large amount of formed elements. In cases xiii. and xx. were, indeed, found large cells with large nuclei or vacuoles, both isolated and in groups (Figs. 41 and 42). Some attained the size of 32 by 13 μ . Sometimes they were round or angular, sometimes pear-shaped. Sometimes the protoplasm presented a peculiar thready appearance. When I first saw them I laid much stress on them, but with

¹ Ibidem, p. 870.

growing experience I have become more and more sceptic as to the possibility of distinguishing cancer by the fluid contained in the cyst. Thus, in case xv., which was only a *myxo-fibroma* without any sign of malignancy, the fluid contained also rather large epithelial cells, sometimes with a large nucleus or with a vacuole. In case xxiv., which was simply a myxoid glandular proliferous cystoma, without any trace of sarcomatous or cancerous structure of the wall, I found a large pear-shaped body, measuring $81\ \mu$ by $40\ \mu$, with dark granules like the dark variety of Bennett's corpuscles; epithelial cells with prolongations and thready appearance of the protoplasm; and numerous groups of small epithelial cells (Fig. 43), most of which

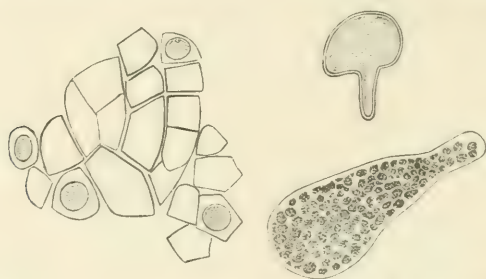


FIG. 43.—Single and Grouped Epithelial Cells from Non-Malignant Ovarian Cyst.

measured only $8\ \mu$, whilst the largest reached $24\ \mu$. In case xxv., in which there was a double papillary proliferous cystoma, but no sarcoma or cancer, were found groups of cells of different sizes with vacuoles. In case xlvii., which was a simple myxoid proliferous cystoma, the fluid was so full of epithelial cells that it looked like pus, although it did not contain a single pus-corpuscle, and on standing it separated into a clear upper layer and a deposit three times more voluminous.

Thus, in my experience, neither the quantity nor the size, nor the shape, nor the arrangement of the elements found in the cystic fluid enables us to tell that it comes from a sarcomatous or carcinomatous cyst, but in all cases it was easy to tell the cystic origin of the fluid by the characters set forth in speaking of myxoid cysts.

With regard to power of resistance to decomposition, I found the epithelial cells perfectly preserved a week after operation in case xlviii. After two weeks they were dissolved to a

grumous mass, and only a few Bennett's corpuscles and nuclei with shining granules, were still present.

Other observers have thought to find characters peculiar for fluid from malignant cysts. Thus Spiegelberg,¹ in 1859, described some peculiar elements in a case of cancer. In 1875 and 1876, Thornton wrote at some length on the subject,² and Spencer Wells states in his lectures³ that, if the large groups of cells described by Thornton are seen in a fluid, one may be pretty certain the tumor is malignant of some kind. I have not found his groups composed of large pear-shaped, round or oval, granular cells with several large, clear nuclei, nucleoli, and vacuoles in any of my cases of sarcomatous, carcinomatous, or papillomatous cysts. We shall come back to the subject when treating of ascites.

[To be concluded in the next Number.]

ON ANTISEPTIC MIDWIFERY AND SEPTICEMIA IN MIDWIFERY.

BY

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RECENTLY there has been much discussion on the theme of "Antiseptic Midwifery." So far as antiseptic appliances are concerned, they can strictly only be regarded as subsidiary means in the carrying out of the great principle that lies at the bottom of all good obstetric practice, namely, to screen the lying-in woman from those poisons and other noxious influences which threaten her from within and from without.

It is not, therefore, desirable to devote special or separate attention to what after all is only a part of a great therapeutical scheme. The essential thing is, to take such a large view of the physiological and pathological processes as will give the right indications to call upon each and all of the therapeutical agents at our command. To fix the mind too intently upon

¹ *Monatsschrift für Geburtskunde*, 1859, vol. xiv., p. 205.

² *Medical Times and Gazette*, April 10th, 1875, and May 13th, 1876.

³ *Medical Times and Gazette*, 1878, vol. i., p. 669.

any one of those agents, is to incur the danger of neglecting others, and of losing sight of the principle which ought to guide the application of all, as one force directed to one end.

To form an intelligent and comprehensive scheme of treatment, we must then seek to attain a full knowledge of the conditions which, separately or in combination, threaten to work or are working disorder in the puerpera.

The foundation of puerperal disease is laid during gestation. With the completion of labor, the conditions predisposing to disease gather strength. During the puerperal state fresh elements of danger accumulate. All these three states bring their contingent to the development of every puerperal disease. This proposition will become evident in its truth as we proceed.

But we must start with a fundamental proposition which differentiates the diseases of the gravida from the diseases of the puerpera.

The diseases of the gravida are diseases of high nervous and high vascular tension. The diseases of the puerpera are diseases of low nervous and low vascular tension. In the gravida, the balance of osmosis is centrifugal; in the puerpera it is centripetal. The diseases of the gravida arise out of natural conditions exaggerated in intensity. Thus, the most striking examples of high tension in excess are seen in the albuminuria and eclampsia, and the hemorrhages of pregnancy. An active process of building is going on, and everything is made subservient to this work. But the moment this work is complete, the reverse process of demolition, of carrying away the refuse, is begun. Absorption and excretion then are the ruling energies. Of course, an active absorption, commensurate with and subservient to the process of construction, goes on during gestation. But this is a very different thing from the absorption of the refuse-stuff which, having served its purpose, has to be cast out from the body. This refuse-stuff, if not duly excreted, may be as poisonous as are the elements of urine if not duly excreted. Hence we see that, in pregnancy, thrombosis, phlegmasia dolens, septicemia are extremely rare, whereas, during the puerperal state, they are common.

Before entering upon the discussion of "antiseptic midwifery," we ought to form a clear conception of what consti-

tutes "septicemia in midwifery." When a puerpera is assailed by any fever-producing cause, her condition is a complex one. We cannot condense the various factors concerned into a simple expression that shall approach a rigorous definition. In dealing with most, if not with all vital processes, any attempt at concise definition is certain to be frustrated. Essential factors will be neglected, and the more terse and striking the definition the more certain it is to deceive. Instead of defining septicemia, I will endeavor to describe it. Now the word "septicemia," as used in obstetric discussions, is itself a definition. If by it we understand simply that a special poison has been taken up into the blood of a puerpera, we have a most imperfect idea of the case. We frame a picture in our minds which is far from representing what is passing in the poisoned puerpera.

If, then, we continue to use the word septicemia, and it is too convenient to reject, we must interpret it broadly, giving it some elasticity. In the first place, I would propose that the word should not assume that a distinct specific poison, or sepsis alone, is concerned, but that it should be used comprehensively as a general term, implying that the blood of the puerpera is poisoned. Theoretically, or in imagination, we may conjure up a specific poison and call it "sepsin;" but can it be physically and clinically identified?

Koch¹ includes all cases of general traumatic infection in which no metastatic deposits occur under septicemia, and those in the course of which such deposits occur under pyemia. If it be established, and Koch goes far to establish it, that bacteria are hardly ever found in the blood in septicemia, whilst they are commonly found in pyemia, his distinction may rest on good scientific grounds. Investigations in this direction promise rich results in practice; but in the mean time the most useful line of speculation must be drawn from clinical observation. In many cases we may, to all appearances, have Koch's septicemia running into his pyemia. Are the two affections distinct *ab initio*? This deeply interesting question cannot, it seems, yet be answered. We may, however, when occasion requires, use the terms septicemia and pyemia in Koch's sense. But we want a general and comprehen-

¹ New Sydenham Society's edition.

sive term. We cannot find one better suited than the old word "toxemia." It implies no theory. It is simply the expression of the fact that some poison has been developed in or has been introduced into the blood. Having by observation of well-known symptoms verified this fact, we then proceed to analyze, to differentiate if we can, and to fix the particular poison which is at work.

If we accept septicemia in the same sense as toxemia, the term "antiseptic midwifery" assumes a correspondingly larger significance, and we shall be led to form a more useful, a more clinical conception of one of the most deeply interesting problems in obstetrics.

Let us endeavor to trace the several factors which enter into the problem.

1. There is the blood of the gravida modified by the processes of construction and nutrition of the embryo and uterus. They are: excess of fibrin, diminished proportion of red globules, increased proportion of water, increase of white globules.

These characters are found at the time of labor, and the blood so constituted, differing as it does from the blood of woman in her ordinary state, is the blood in which are wrought the post-partum and puerperal processes. Nor is the peculiar state of the blood all. The altered blood is associated with universal changes going on in the body. Tarnier reminds us that "Science records day by day new facts which lead us to conclude that in the pregnant woman there is not a single fibre or a single drop of liquid which does not undergo some modification."

If there has been much hemorrhage during or after the labor, the blood has become more watery and more charged with fibrin. The excess of albuminoid or colloid materials increases centripetal osmosis.

2. There is the fall of nervous and vascular tension involving a change in the dynamic state of the circulation.

3. There is a period of comparative rest following labor, of preparation for the active processes of breaking up of the tissue used during pregnancy, now superfluous, and of casting out the refuse-stuff. This period may be stated to be about forty-eight hours. We rarely see evidence of self-empoisonment before the third day.

4. At the end of the second day the process of disintegration of the uterus and other organs has begun. An immense revolution is at hand. The proceeds of the disintegration of the uterus and other superfluous structures are rapidly taken up into the circulation, *and ought to be as rapidly converted and excreted*. Absorption revives. The lymphatic vessels and venules have come into active function. If the lymphatic system and liver, especially, fail to modify the waste-stuff brought to them, so as to fit it to enter the circulating blood, then this unprepared unmodified waste-stuff is noxious, poisonous. Hence one form of toxemia.

5. But even assuming that the waste-stuff enters the blood-mass properly prepared or digested, unless it be got rid of *pari passu*, there will be accumulation of waste-stuff in the system. This again is a form of toxemia. Hence there must be easily-working excretory organs; the lungs, kidneys, skin must be sound.

6. Now it is obvious that both the evils pointed out may co-exist, that is, the conversion of the waste-stuff and the excretion may both be defective. Hence already we see a complex toxemia, purely endogenous, derived from no external source.

7. Fresh dangers are at hand. It is a remarkable fact—not without practical interest beyond our immediate theme—that all the successive steps in the history of reproduction are marked by violent lesions of tissue, ruptures, or lacerations. The bursting of the Graafian follicle and ovary, the frequent rupture of the fourchette and of the hymen in coitus, the tearing of the cervix uteri during the passage of the child, the disruption of the placenta from the uterus, the laceration of the perineum, are obvious illustrations of this proposition. Another fact, less obvious but even more constant than some of the preceding, is the violent bruising to which the parturient mucous tract is exposed during labor. A process which may be likened to glacier-action takes place. The mucous membrane in contact with the head glides down under the influence of friction, separating it to some extent from the submucous tissue. In this movement the connecting vessels are torn. Hence the ecchymosis commonly seen in autopsies about the cervix uteri and vagina, if performed within a week of the labor. Not only is there commonly found extravasated blood, but a quantity of

serum in the connective tissue. In about two or three days the epithelial layer of the mucous membrane, crushed, begins to be exfoliated. This is effected more or less completely at different parts; most completely at the cervix uteri.

Limiting the application of these facts to our theme, we see here the traumatism which plays so important a part in puerperal septicemia. The lacerations of the cervix uteri and perineum have often been insisted upon, especially by the German school. The wound of the uterine surface left by the disruption of the placenta had been likened by Cruveilhier, Robert Ferguson, and others to an amputated stump. The barring of the mucous membrane has not hitherto, as far as I know, been considered. I am disposed, however, to think it is often the most important factor in the poisoning process. It is the most active and constant septicode or poison-route.

8. Here then are several roads open to the reception of poison from the mucous tract. If no poison collect on any part of this septicode receptive tract, the wounds heal readily and the door is closed. It matters little that there existed an extensive traumatic surface. But if blood or lochial discharge remain in the uterus or vagina, and air find its way into contact, decomposition takes place. A foul fluid bathes the wounded mucous tract and at some point or other finds an entry into the system. This is still a form of autogenetic toxemia, but it differs from that form which is the result simply of the accumulation of badly-prepared or excessive waste-stuff in the blood, by the addition of foul stuff from the uterine discharges. The case has increased in complexity. There is, first, the fundamental state of the blood derived from the gravid process; second, the blood further modified by the waste-stuff from disintegration of tissue, and third, there is the septic stuff taken up from the wounded mucous tract. Whenever the blood is poisoned, be it with septic stuff or other, the natural process of purification, of excretion of the waste-stuff is obstructed, the balance between disintegration, absorption, and excretion is lost. The simple septicemia then, as imagined and described, cannot exist.

9. The puerpera is still open to toxic invasion from other sources. Poisons altogether foreign to her may be brought into contact with the traumatic tract and be absorbed. Thus

the cadaveric poison from dissecting may be inoculated by the finger used in examination; other poisons, the result of diseased action, clinging to the obstetric finger may be inoculated in like manner; sponges or linen tainted with similar poisons have been the carriers of poison to the genitals. In some of these instances it is probable that bacteria play an important part.

Thus another complication is added. All the elements of blood-alteration already recited are at work and are intensified by the new poison from without.

10. Then the puerpera is peculiarly susceptible to the ingestion of the zymotic poisons: typhoid, variola, scarlatina, rubeola, erysipelas act with special virulence in the blood of the puerpera. It has been the fashion to say that scarlatina in a puerpera is scarlatina and nothing more. It is something more. The scarlatina-poison finds in the puerperal blood, loaded with refuse-stuff which it cannot excrete, a medium specially favorable to the development of mischief. The subject may have had scarlatina before. She may have enjoyed the full degree of protection until she became pregnant. Under this protection, contact with the scarlatina poison may have been harmless. If inhaled or otherwise absorbed, it failed to ferment. It was quickly eliminated. But if this poison enter the puerperal blood, its elimination is arrested, the morbid train is fired. We have developed a form of toxemia compounded of the autogenetic forms previously described and of the scarlatina-poison. This is very different from simple scarlatina. In these cases the characteristic rash is often wanting. It may be doubted whether the zymotic poison goes through the successive stages of zymosis characteristic of the simple scarlatina. The poison works in a specially prepared field in a special manner. It throws out of order the puerperal process. It arrests or prevents the disintegration process, the due absorption by the lymphatics, the modifying action of the lymphatic glands and liver, the excretory function of the lungs, skin, and kidneys. Thus we get a complex poison which cannot be called waste-stuff poison, septicemia, pyemia, or scarlatina, but is a compound of all, and perhaps of some new innominate poison, the product of their inter-reactions.

12. Another factor must not be lost sight of. Emotional disturbances play an important part. An emotion-storm may so affect the heart and nutrition that the blood curdles, clots suddenly. The influence of emotions upon secretion and excretion is well known in some conditions. It is not so well known in the puerperal state. But that it may and does profoundly impress the circulation, nutrition, and excretion is certain. Emotion is in many cases the most conspicuous genetic cause of puerperal fever. Where it is not the primary cause, it may often be a secondary exacerbating cause. We may summarize the forms of puerperal toxemia under three heads.

1. The self-empoisonment resulting from the loss of balance between absorption of waste-stuff and its excretion. This may be called *endosepsis*, since the poison arises within the system.

2. Self-empoisonment from absorption of the foul stuff of decomposition in the uterus. This may be called *autosepsis*, since the puerpera takes poison of her own making. This is what has been more especially called septicemia.

3. Empoisonment from foreign sources. This may be called *exosepsis*.

There may be a simple endosepsis, but autosepsis also implies endosepsis; and exosepsis is a compound of all three.

Endosepsis is not, I believe, communicable or infectious. Autosepsis is. The discharges from one puerpera, which are capable of poisoning herself, may poison another puerpera. Exosepsis is doubly infectious. It is infectious as autosepsis and as a zymotic.

Having taken account of the poisons which threaten the puerpera and of the gates by which they may effect an entry, we shall be better able to protect her. Two great objects have to be kept in view. First, to keep all extraneous poisons out. Secondly, if any effect an entry, to counteract their noxious influences. A primary condition essential to the successful attainment of these two objects is to put the system itself in the best position for defense; that is, to secure the sufficient working of all the organs concerned in nutrition and excretion. The carrying out of this programme fully is antiseptic midwifery in the broad sense. The adaptation of the Listerian or conventional antiseptic precautions is antiseptic midwifery in the partial and narrow sense.

Unfortunately the first condition of effective resistance to toxemia is not always attainable. We must take the puerperal subject as we find her; perhaps with damaged kidneys or liver, deficient in nerve-power, in fibre, and with skin and lungs unequal to the new task thrown upon them. This is another way of expressing an aphorism which I have taken other opportunities of illustrating, namely, that *pregnancy is the great test of the soundness of the subject.*¹ Under this test many women break down. They break down at various stages of the process. Some get no further than abortion; some hold out a little longer; some fail in the effort of parturition; others break down under the strain of childbed.

About the third day, it is a familiar fact that some slight rise of temperature and a quickened pulse attest a degree of febrility. This has hitherto been considered as "milk-fever," it being assumed that the starting of the new function in the breast causes febrile disturbance. Sometimes the term "ephemeral fever" has been used. Now, it deserves to be considered whether this febrility occurring on the third day be really due to the milk secretion; that is, is it physiological? Is it a constant phenomenon? It is not constant. If the breasts are sound and perform their function well, there is no fever. If there is fever, it obstructs the due secretion of milk. If the breast is not in a fit condition to secrete, then, indeed, fever is excited.

Dr. Fancourt Barnes has made observations which seem to determine this point. So long as antiseptic care was not observed at the British Lying-in Hospital, high temperatures ruled; when antiseptic care was strictly observed, high temperatures were rarely seen.

The truth is, that about the third day is the epoch for the establishment of the absorptive process. The two days following labor are a period of rest. During this time the disintegration of the uterus and other superfluous structures is only beginning. The supply of waste-stuff for absorption is scanty. This can hardly be a source of fever. And if there be any blood or other matter in the uterus, it will hardly decompose under two days or more, so as to yield septic stuff for absorption. But on the third day, waste-stuff is pouring into the

¹ See Gynecological Transactions, Vol. I.

blood; decomposition may have begun in the uterus, and active absorption finds material to work upon. Thus it is that febrility occurs on the third day. The mammary glands labor under the disturbance induced, their healthy action is impeded, and being under easy observation, their struggle against the fever is interpreted as the cause of the fever.

1. The obvious lesson to be drawn from this history is to begin antiseptic treatment early. Indeed, it begins with the conduct of the labor. The first great point to be aimed at is to secure firm contraction of the uterus. It is superfluous to dwell upon a point so universally recognized. But it is not superfluous to dwell upon certain means that lend powerful help in securing it. The immediate object sought in securing contraction is to obviate hemorrhage. To obviate hemorrhage is to oppose septicemia.

Passing by the usual manœuvres exercised in dealing with the placenta, I will only insist upon the utility of the pad and binder. The compression exerted upon the abdomen and pelvis not only tends to provoke uterine contraction, but it counteracts the aspiration or suction-force which tends to draw air, one of the factors of decomposition, into the uterus. It opposes centripetal osmosis. The day after labor it is useful to give an aperient. It commonly happens that, in the effort of defecation, the uterus, compressed and sharing in the diastaltic expulsive action, expels a clot. It then contracts more effectually. The maintenance of contraction is efficiently aided by oxytocics. It has been my custom for many years to give after every labor a mixture of quinine, ergot, and digitalis three times daily, continued for two or three weeks. The effect in contracting the uterus is remarkable. The patient will often say that she feels the womb contract soon after taking a dose. I look upon this measure as foremost in the scheme of antiseptic midwifery. It is shutting the gate in the face of the enemy.

2. The next thing is to *wash out the uterus*. Plain tepid water may serve the purpose, but a solution of carbolic acid, one in fifty, is better. This should be done once or twice a day from the second day. On the first day, as we have seen, there is little risk of absorption, and it is important to disturb the patient as little as possible. Should there be the slightest rise

of temperature and pulse, this intrauterine injection is imperative. Those who have used it can tell of temperature and pulse reduced, rigors and other signs of toxemia subsiding after each injection, and ultimately enabling the patient to pull through the most threatening illness. The injection is best done by a gravitation or siphon tube. Thus a gentle, uniform stream is insured, all jerking propulsions are avoided, and it is easy to exclude air.

The beneficial action of carbolic acid or iodine injections is threefold:—First, the uterus and passages are washed out; secondly, the lining membrane of the passages is stimulated in a healthy manner, so that it is less favorable to the reproduction of foul stuff; thirdly, some small portion of the carbolic acid or iodine penetrates the substance of the uterus, and is absorbed into the system, thus chasing and neutralizing any poison that may have entered. Thus we follow the enemy through the gate which admitted it. The uterus and vagina, whilst serving as a septicode, are also made to serve as a passage for the antidote. This especially applies to iodine, which readily penetrates the uterine wall. We ought not to refer to intrauterine injections to wash away septic stuff without grateful remembrance of Harvey the Immortal, who thus cured a lady in imminent danger of death from septicemia.

The manipulations necessary for intrauterine injection give valuable information as to the position and other characters of the uterus. A not uncommon cause of retention of discharge is retroflexion or antelexion. Reduction should, of course, be effected before injecting, and means taken to keep the uterus in situ afterwards.

In connection with intrauterine injections, carbolic solution should be kept in the room. The catheter should be kept in it. If sponges are used, they should be kept in the solution; but it is better to exclude them, and use soft tow soaked in the solution, and throw it away immediately after use. Instead of diapers, which it has been proved are a frequent source of contamination, as “they come from the wash,” but not from purification, some such contrivance as the “ladies’ towel” should be used. These consist of light cotton-wool or tow, impregnated with carbolic acid or other antiseptic. They are burned after use. The physician and the nurse should practise

no manipulation without previously washing in carbolic solution, and lubricating the hand with carbolized vaseline, religiously rejecting lard and other animal grease. The chamber utensils should be rinsed with carbolic solution, and a little of the solution always kept in them.

It is probable that sulphurous acid will be found even better than carbolic acid as an antiseptic. Carbolic acid in ovariectomy certainly acts sometimes as a poison to the patient and to those assisting at the operation. At St. George's Hospital, we have lately used sulphurous acid with at least equal advantage, and without the toxical drawback. Dutrochet, in his investigations on osmosis, found that the slightest trace of sulphurous acid stopped osmosis. It may be used in the proportion of one sulphurous acid to forty of water.

3. Whilst taking care to exclude foul stuff from the genital canal, we must *be careful to exclude foul air from the lungs and skin*. A supply of pure air is an obvious necessity, but too frequently frustrated. When the sun shines, open the window. At night, especially, a fire is often the condition of good ventilation. If an Arnott's valve be adapted, the fire will then draw off the light foul air which rises to the ceiling, insuring a supply of fresh air from below.

It is of the utmost importance to guard against chill or any check upon the due action of the skin, lungs, kidneys, and intestinal canal; that is, maintain in due working order the excretory organs.

4. Dr. Goodell has much insisted upon the *drainage of the uterus* as a means of getting rid of noxious stuff. The principle is admirable. There is no doubt that in the ordinary recumbent posture blood and discharges are apt to collect in the lax uterus and vagina. Dr. Goodell recommends that the patient should at times be raised into the sitting posture, to allow the fluids to drain off. Where a woman is strong, and after a few days, this plan may *perhaps*—I emphasize *perhaps*—be adopted without disadvantage; but in the weakly subjects most prone to septicemia, especially after hemorrhage, sitting up has been followed by syncope and sudden death. If firm pressure be maintained upon the hypogastrium and antiseptic irrigations be duly observed, drainage is secured. At the same time, if the bed is properly made, so that the

head and shoulders are kept at a slightly higher level than the pelvis, drainage will be fairly accomplished. The dorsal decubitus is more favorable to drainage than the lateral.

5. An effective barrier against the ingestion of noxious stuff from the parturient canal is to *supply the system with healthy nutriment by the stomach*. The more the system is supplied in this way, the less will it absorb from vicious sources. I believe Oldham was one of the first to lead the revolt against the old fashion of starving on gruel during the first week; but it is easy to err in reaction. During the first two days the system craves rest as well as food. Food that is not easily assimilable is apt to load the stomach lying undigested or badly digested. Light broth, beef-tea, milk, toast, or eggs, plain or variously combined, are enough for the first two days. Gradually more solid food may be added. Light stimulants are occasionally useful, but generally alcohol may be dispensed with.

We may summarize antiseptic midwifery in the following rules:

1. Keep the door shut against the enemy by maintaining contraction of the uterus.
2. Prevent the enemy from forming and collecting by irrigating the parturient canal with antiseptic fluids.
3. Eject the enemy as fast as he effects an entry; that is, keep the excretory organs in activity.
4. Guard the lying-in chamber against the approach of foreign poisons.
5. Fortify the patient against the attack of the enemy by keeping up due supplies of wholesome food.

Antiseptic Midwifery in Lying-in Hospitals.

Given fairly healthy subjects, scrupulously guarded in the manner described, women lying-in in their own homes will present but rare examples of fatal septicemia. But when lying-in women are massed together in one building, the difficulty of safeguarding them is vastly greater. Perils gather around them in an accelerating ratio. If the history of many lying-in hospitals could be fairly written, we should have a terrible record of lives sacrificed to ignorance, to reckless disregard of medical authority, to architectural folly, to mal-

administration, to scandalous experimentation of fanciful crotchets. Uninformed benevolence overriding the practical benevolence of science has always been prolific of disaster. Nowhere can it count more victims than in lying-in hospitals.

In hospitals, septicemia, or other forms of puerperal fever manifest an active tendency to spread. Many of the so-called epidemics of puerperal fever in lying-in hospitals have undoubtedly been examples of the spread of zymotic fevers. But another class of apparent epidemics undoubtedly owe their origin and spread to contamination, by what may rightly be called the "puerperal poison," meaning by this, the product of decomposition of blood and discharges in the parturient canal. The poison that one puerpera may thus make for herself may be carried to another puerpera, and so on, through a ward. *Proxima ardet*; the fire quickly spreads when the fuel is at hand.

The first imperative condition for the safety of women in lying-in hospitals is the absolute single authority of the physician. If this is denied him, his duty to humanity and to his profession is to resign. This is the condition upon which he attends a private patient in her own house. It is infinitely more necessary that he should insist upon it, when the care of many women in a hospital is thrown upon him.

A leading principle is to assimilate the conditions of each patient in a lying-in hospital as nearly as possible to those of the patient delivered at her own home. Isolate as much as possible. Take all care that any ill that may attack one patient shall be limited to her.

A brief account of the scheme of the Paris Maternité devised by Tarnier, and described by him to the Obstetric Section of the International Medical Congress, in London, 1881, will be the best illustration of this principle carried into practice. M. Tarnier said that in 1856, when he was interne at the Maternité, the mortality was about 5 in 100; this was now reduced to 2 in 100 in the hospital generally, and to 0.75 in 100 in the pavilion he had had constructed a few years ago. The chief point in this pavilion is that each patient has a separate room, entered from the outside, so that a nurse can only pass from one room to another by going outside into the open air. The furniture is all of japanned iron, the floors,

walls, and ceilings are of impermeable concrete. The mattresses and pillows are stuffed with oat-chaff, which is burnt after use in every single case. Instead of a mackintosh sheet, a sheet of brown paper made impermeable by pitch is used, and this too is burnt after use. He has used various antiseptic solutions for the washing of the genitals: borax, carbolic acid, sulphurous acid, and bichloride of mercury. As the result of his experience, he concludes that a weak solution of bichloride of mercury is the most powerful germicide.

The description given by Dr. Fancourt Barnes of the system in force at the British Lying-in Hospital is a further practical illustration of the rules necessary to secure safety. Every patient is delivered under the carbolic spray. This disinfects nurses and pupils who are assisting, and prevents the entrance of germs or foul matter into the genital tract at the moment when it is distended and opened by the passage of the child. All washings, syringings, and examinations are done with carbolic solution. Carbolic spray, of one in eighty, is nearly continuously playing in each ward. To secure contraction of the uterus, each patient has a mixture of quinine, ergot, and opium three times a day, for the first week. Since instituting the above practice, he rarely finds any rise of temperature during the lying-in.

We may thus hope to see the day when women can be delivered in lying-in hospitals as safely as in home-practice.

PRACTICAL REMARKS ON STEM-PESSARIES.¹

BY

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[In conversation with the Editor of this JOURNAL, at the meeting of the American Medical Association at Richmond, Va., last spring, I communicated to him the results of the use by me of intrauterine stem-pessaries during the last twenty years, which he thought ought to be published in the interests of many suffering women and of gynecological science (by the way, can we not substitute "gynopathy" or some even less objectionable word for the tautological, stilted, and over-ambitious periphrasis I have employed?), and requested me to put them in shape for publication: which I have accordingly done.]

Upon examining Dr. Emmet's excellent work upon the Principles and Practice of Gynecology, I have been surprised to see how slightly he speaks of the intrauterine stems, which I have used largely with good results, and omits entirely any directions for their proper employment. His experience of them in cases coming under his notice must have been different, and hence he has dismissed them with scant and uncomplimentary mention, except for hypertrophy of the cervix. I may, therefore, preface this article with an account of my method of using them, and the forms I have employed, as well as the precautions I find necessary. Like everything else that is powerful for good when rightly used, they are powerful for evil if wrongly or carelessly used.

In the first place, I never use them when there is an active inflammatory process going on in the pelvis. In such cases I endeavor to subdue it and wait until there is only such chronic congestion as may result from impeded circulation due to malposition of the uterus. In the second place, I measure carefully the internal diameter of the uterus, and employ a stem measuring one-eighth to three-sixteenths of an inch less, from the top of the bulb to the point. If there is *not* this difference, there is danger of the point being forced against the

¹ Read before the Philadelphia Obstetrical Society.

uterine wall or fundus by some sudden blow or pressure upon the lower part of the abdomen, or by the contraction of the uterus itself. If there is more, in case of flexion the uterus may become partially or completely doubled on itself, and be wounded or bruised in the same manner. I am inclined to think that want of proper accuracy in following this rule has been the cause of want of success in many instances, and of the disfavor and dread with which many practitioners regard it. I have often met with cases in which a flexion of the body caused the obtaining of an internal diameter half an inch or more less than the true one. I therefore proceed always with the sounding of the uterus until I am sure that the point of the sound is at the fundus, and that I have the correct measurement.

In the third place, I always enjoin absolute rest on the patient until all danger of inflammation or hemorrhage after its introduction has passed, and some degree of tolerance has been established. To further this, they are directed to remain in bed, to use opium and belladonna suppositories, and to keep the lower bowel empty by the daily use of an enema of flax-seed tea. Usually after the introduction of a stem-pessary, uterine congestion will be set up, and pains and hemorrhage will occur precisely similar to those of a threatened abortion. To control these is the office of the opium and belladonna suppositories, and after they have subsided the regular more or less rhythmic contractions of the uterus promote such changes in its nutrition as occur in any other muscle. It is precisely this result which in the great majority of instances I hope to attain, thereby modifying the nutrition of the uterus as it is modified as the result of pregnancy.

Should serious threats of inflammation supervene instead of symptoms resembling threatened abortion, the stem should be withdrawn and the inflammation dealt with at once. But the practitioner should expect and be prepared for the occurrence of a considerable loss of blood, amounting almost to hemorrhage, and should warn the patient accordingly, and insist on perfect rest until it has ceased. Unless excessive, it will generally prove of service just as a very free menstruation would.

The importance of this rule cannot be overstated. One fatal result followed disobedience to and neglect of it.

I began in 1858 to use Sir James Y. Simpson's instruments, but soon finding that the varying internal diameter of the uterus required the intrauterine portion to be varied, improvised them by slipping a copper ball-disc, perforated in the centre, upon a sound made just flexible enough to be bent with some force and yet capable of retaining the shape given it. The diameter of the uterus having been ascertained, the ball is slipped on the sound to a distance one-eighth of an inch less from the point, and prevented from passing farther by bending the sound to the same angle as that of the vaginal with the uterine portion of Simpson's instrument. The patient lying on her back, the uterus is then to be brought into the normal position, if there has been any deviation or flexion. For this purpose I use generally an ordinary sound, such as employed by the late Dr. Washington L. Atlee, keeping the uterus in position with a finger in the vaginal cul-de-sac until the intrauterine stem has been well passed into the uterus. This part of the operation requires some patience and dexterity, which a little practice will soon supply. After the stem has been fairly passed to the fundus, and by bimanual palpation I have satisfied myself that the position of the uterus is normal, the long end of the sound protruding from the vulva should then be bent up (the vaginal portion meanwhile being firmly held) so as to lie flat on the abdominal wall. The use of a T-bandage will be necessary for a time to prevent too free motion of the instrument. But any external form of support is very inconvenient and liable to serious objections from the friction and pressure made at the external orifice, so that I employ Simpson's instrument or my modification of it only when for some reason I cannot use a well-fitting Smith's Hodge in the vagina, which, by slightly anteverting the uterus, enables the pressure of the posterior vaginal wall to keep the intrauterine stem in place. I have used largely the glass-rod with a hard-rubber disc like those which I believe Dr. Meadows introduced to the notice of the profession. The rods I have had made three and one-half inches long; by marking with a small file, they can be broken off at any desired length, and the broken end melted round and smooth in the flame of a spirit-lamp. I have also had made by Messrs. Gemrig & Sons a series of hard-rubber intrauterine stems, varying by one-eighth inch each

from two and one-quarter inches to three and one-half inches, and of these I keep a supply at hand. I also employ frequently the galvanic intrauterine stem, made by partly coating the upright copper stem with zinc. The latter metal is soon attacked, and in cases where I desire to produce an alterative action is far more efficient, whether that action be due to a constant but slight primary galvanic current (as I am disposed to think) or to an irritation of the lining membrane of the uterus, similar to that of a vesicant on the skin. A more profuse bleeding and constant slight muco-purulent discharge, with a melting down of chronic induration, is apt to follow their use.

And now for the cases in which I have used them. These may be classed under the headings of chronic metritis, fibroids, flexions, reflex paralysis, and hystero-epilepsy: though frequently the same case might well be included under two or more headings. Many of the patients I have had under observation for years, and can thus speak of the benefit they received as from no mere transient knowledge of the results. But on the other hand I must describe them rather as they present themselves to my memory, from the meagre data I can gather from my note-books, than from accurate records kept for publication.

CASE I.—Mrs. B. L., married, aged forty, had been under my care at various times during some years previous to September, 1861, for attacks of eczema of the hands, forearms, and chest, alternating with bronchial attacks and severe leucorrhea with excessive pruritus. She was a small, spare-built woman, anemic and nervous, constantly requiring tonics. I had treated her with iron, arsenic, wild cherry, cod-liver oil, etc. She had retroversion also, which I tried to relieve, but with only partial success, by various forms of Hodge's pessary. Noticing that her condition seemed mainly due to the translation of the eczematous irritation from the skin to the bronchial mucous membrane or to the vagina, and thinking that her nervous anemic state was the cause of this, and due itself to the interference with her nutritive functions by the retroversion of her uterus, I attempted, and for a time with success, to correct the position of the latter by Simpson's intrauterine pessary. But after wearing it with much relief for five months, she was attacked with pelvic abscess and sank under the prolonged discharge, very much emaciated, February 15th, 1862.

CASE II.—E. P., single, aged eighteen, came under my care for supposed Bright's disease in 1860. General debility and great depression; a slight but well-marked mitral murmur; swollen ankles and occasionally a trace of albumen in the urine; attacks of headache and sometimes faintness verging into unconsciousness with a suspicious resemblance to epilepsy; scanty menstruation

and obstinately sluggish bowels: but nutrition fair. As menstruation was painful as well as scanty, and the head symptoms worse about the monthly period, I examined her womb carefully. It was enlarged and harder than natural, giving an idea of general hypertrophy. After exhausting my ingenuity in treatment without avail through several years, I determined upon the employment of a galvanic intrauterine stem, which was done March 16th, 1874. The result was gratifying; menstruation became regular and painless, her whole expression changed, and she became, and has continued, practically a well woman. When her head symptoms threaten her again, as they do occasionally, she comes to see me; and I reinforce the activity of the pessary by the employment of a current from Kidder's battery as strong as she can bear it for twenty to thirty minutes. But she will not part with her pessary. When it wears out I am obliged to have it renewed. I have endeavored several times to persuade her to try going without it; she has done so, but in the course of a few weeks comes and begs that it may be replaced. She has therefore worn it now for seven years almost continuously. The uterus is now about 3 in. int. diam. with rather dense walls, but no well-marked fibroid tumor. Still I suspect that such is the real cause of all her trouble.

CASE III.—S. G., single, aged twenty-four, came under my care in 1868. She was a robust, healthy woman suffering with deafness, which became much worse at the menstrual period: the discharge was scanty and painful. Examination revealed a fibroid tumor in the left side of the posterior wall of the uterus, firmly adherent to the brim of the pelvis from periuterine effusion and growth. With considerable difficulty the mass was gradually elevated above the brim, and a galvanic stem then introduced into the uterus and worn for some months with the effect of improving the mobility of the uterus and increasing the menstrual flow, as well as relieving to some extent the deafness. Its use was continued at intervals for two or three years, with the effect of keeping the growth down and producing more or less muco-purulent discharge. The uterus became movable. In 1875 she married and became pregnant: the pessary had been removed, as she was very anxious to have a child, and it was hoped that the uterus was sufficiently free to allow it to rise above the pelvis; and that, as the fibroid was on the wall and not in the cavity, there would be room enough for a living child to pass, and that the subsequent involution would promote its absorption. Unfortunately this proved not to be the case. At my request, Dr. Washington L. Atlee saw her with me, as he had done previously, and it was determined, if after the fifth month the uterus remained immovable, that the uterus should be emptied, as the available space in the antero-posterior diameter of the brim of the pelvis was little over two inches. I tried vainly to elevate the mass at the time agreed upon, and therefore, on June 15th, 1876, passed the sound so as to rupture the membranes. My friend, Dr. Jacob Price, of West Chester, took charge of the case for me. The labor came on in

five days, and she did well, except for an attack of metro-peritonitis, the result of an exposure to cold. After her recovery, the intrauterine stem was replaced, and worn for three years. At the end of that time, the uterus having again become more movable, I consented to its withdrawal, but pregnancy has not again occurred. The uterus is now enlarged, especially on the left side; the general health excellent.

CASE IV.—Miss B. G. W., aged forty-five, was a patient of the late Dr. Hodge, who placed her under my care in 1871, for a tumor of the left mamma which had suppurated. She had for many years been suffering from retroflexion of the uterus, which caused obstinate constipation, hemorrhoids, indigestion, and great nervous disturbance. After his death in 1873 she consulted me as to her uterine trouble, and I succeeded in passing a sound, curved almost in a semicircle, to the fundus, by using a flexible catheter first as a guide; for so complete was the flexion that the fundus felt more like a retro-uterine tumor or misplaced ovary; and then reversing the sound elevated the fundus to its place. A stem-pessary was then used to maintain it, supported by a Hodge's closed lever. The relief was immediate: and she continued to wear the stem until her courses ceased. Since then I have seen her frequently, and though her digestion continues very feeble, she is otherwise in good health.

CASE V.—Miss E. S. R., aged forty-four, was placed in my charge by my father, Dr. Caspar Morris, in October, 1867. She was then confined to her bed as she had been for eighteen months previously, suffering with terrible pains in both legs, which were rigidly extended from hips to toes. The slightest touch or jar gave her acute pain; she had hectic fever, and occasionally uric acid and phosphatic calculi were passed. Her sister had previously suffered similarly, and died of caries of the spine; and in consultation between my father and Dr. Agnew, a similar diagnosis was arrived at in this case. I was present at the consultation, having had charge of her during a previous temporary absence of my father from the city, and having remarked that she suffered more from her rheumatoid pains and from spasms in the muscles during her menstruation which was painful. I suggested that possibly there might be a uterine cause for her sufferings. At Dr. Agnew's suggestion the case was turned over to me, as neither of them had anything hopeful to suggest. On careful exploration, I found anteflexion of the body of the uterus, straightened it out, and fitted Simpson's intrauterine stem. The uterine flow came on soon after, and to my gratification with but little pain; the fever and pains in her limbs also subsided and she was able to take more nourishment. As her knees and ankles remained rigid, I placed her under ether and broke up the false ankylosis, then instituted regular passive motion with the best result. In less than three months she was walking out. She continued in apparently excellent health, walking four or five miles a day for about five years. The stem pessary was withdrawn after she had worn it about six months. Her courses ceased about a year subsequently.

In the summer of 1875, during a visit to the Catskills, her strength seemed to give out, and she consulted me in the autumn on her return to the city. I then found a cyst-like mass in the right iliac and right lumbar region; her urine was loaded with pus, alkaline and phosphatic; and at her request replaced the instrument which had previously relieved her, but without any good result. She continued to grow weaker, and the pus in the urine increased in spite of all treatment by nitro-muriatic acid, bitter infusions, uva ursi, buchhu, etc., until a slight attack of diphtheria carried her off May 7th, 1876. A post-mortem showed both kidneys thoroughly disintegrated and reduced each to the condition of a sac filled with large phosphatic calculi. They are in the museum of the College of Physicians. The uterus still showed a tendency to flex at the point where it had been straightened previously, but was undergoing senile atrophy.

This case was a very remarkable and interesting one, since, even if the formation of the phosphatic calculi in the pelves of the kidneys dates back to an illness in 1870, the relief obtained by the use of the stem-pessary, in 1867, and the good health afterwards enjoyed were too marked to be attributed to anything else.

CASE VI.—Sallie G., aged 35, single, was employed as night-nurse in the Female Medical Ward of the Protestant-Episcopal Hospital in 1871. She consulted me during my term of service there; she was obliged to empty her bladder every half-hour day and night, and had been suffering more or less for eleven years, having been under the care of a number of physicians. Sometimes her urine would be clear for several weeks, when a tumor would gradually form in the left iliac fossa and hypogastrium, then pus would begin to show itself in the urine with great irritability of the bladder, and continue to flow till the tumor was much lessened. On examination *per vaginam*, I found the os uteri drawn up almost out of reach, and the roof of the vagina and lower part of the abdomen filled with a dense rounded mass. A catheter could readily be passed into the bladder, and thence to the right, so as to draw off clear urine, while, when passed to the left, equally clear pus flowed through it. With the speculum no view of the os could be obtained, but with considerable difficulty a sound was passed into the uterus, going behind and to the top of the rounded mass, which was thus proved to be the uterus with a fibroid imbedded in its anterior wall, and surrounded with a mass of indurated exudation. Suppuration had taken place, and the pus found its exit both through the bladder and uterus; occasionally the passage into the former became closed, when the pus accumulated. After breaking a Sims' elevator in the attempt, I succeeded in elevating the mass with a steel sound, and found the uterus measured over four inches int. diameter. But the elevation had the effect of relieving the pressure on the bladder; so I adapted my modification of Simpson's intrauterine stem so as to maintain the uterus nearly in its normal position. She was kept in bed and carefully nursed and fed, her strength supported by tonics, and at length restored to health, though the uterus

continued to measure three and a quarter inches, and the remains of the fibroid could be felt in the anterior wall of the uterus. She took charge of the linen room of the Hospital for several years, then began to suffer with a cough and expectoration. Bronchial râles and general dulness on percussion over the lower part of the right lung, followed by marked dulness under both clavicles, and this by pectoriloquy, wasting and hectic, were the main symptoms successively presenting themselves during the two years preceding her death, which occurred, I think, in the spring of 1880, at the Presbyterian Hospital.

CASE VII.—Mrs. S., aged 24, the wife of a physician, suffered from retroflexion of the uterus, and was placed by her husband under my care. She was thin and feeble, and the body of the uterus flexed at the junction with the cervix; it could readily be bent either forward or backward. I placed for her an intrauterine glass stem-pessary, which she wore for some little time with much relief. One morning, however, as she sat up in bed to greet her husband, who had just returned from market, she suddenly threw up her hands and fell back dead. A post-mortem was made at the request of her previous physician, and I was invited to be present. We were told only the abdomen was to be examined. Another gentleman did this, and when the flaps were turned back there lay the abdominal viscera perfectly healthy. Her previous attendant, peering over the shoulder of the operator, exclaimed: "Why, there was no perforation after all!" I then became aware of what his animus had been; and insisted on the uterus being thoroughly examined. With the glass stem *in situ*, it was in perfect position, and when laid open presented not the least trace of irritation. When the stem was then withdrawn, it doubled over, and could readily be either retro- or anteflexed. I then succeeded in having the chest examined, when the source of a mitral murmur, which had long been recognized, showed itself in a mitral valve studded with granulations. I could not prevail, however, in my request that the brain should be examined, as the husband declared himself satisfied, and her previous attendant opposed it. This case proves by ocular demonstration how free from irritation a properly fitting glass stem-pessary is in the uterus: and how perfectly it fulfils its mission.

CASE VIII.—Sarah B., colored, aged about 45, was a servant in the employ of the Rev. Dr. Cooper. She suffered with Bright's disease, and had besides two large fibroids projecting into the uterine cavity. When I first saw her, in October, 1874, she was anasarcaous, and suffering with effusion into all the serous cavities. Wishing to ascertain what would be the effect on the fibroids of a galvanic stem, I inserted one into the uterus on December, 2d. She lived until January 9th, 1875. On making the post-mortem, I found the stem lying between the fibroids, on the surface of one of which was a track, made by its pressure upon it, and filled with a muco-purulent liquid, while the fibroid itself seemed softer than the other, and about to undergo such degeneration as that I suppose to have taken place in Case V.

These are the only two instances in which I have seen post-mortem examinations of those who were wearing intrauterine pessaries at the time of their death. In neither of them was the end to be attributed in any way to their use.

CASE IX.—H. E. S., aged 32, married, was suffering in April, 1871, from chronic metritis, the result of a difficult first labor. There had been some laceration of the cervix with subsequent thickening and induration. After a long course of ineffectual treatment with nitrate of silver, iodine, iodoform, etc., I determined to incise the cervix; then, as this seemed to do but little good, to use an intrauterine stem-pessary as an alternative. She had remained sterile for some years. I accordingly fitted her carefully with my modified Simpson, and insisted on her remaining in bed until the irritation and hemorrhage, which would probably follow, had entirely ceased. This was on a Friday. She disobeyed me; went out on Sunday, and when, on Monday, she found she was "unwell," as she thought, not wishing to be incommoded with it, got into a cold bath. On Tuesday I was sent for, and found her very ill of metro-peritonitis, of which, in spite of all that we could do, she died the following Friday. I had removed the pessary on Tuesday, but think the result in this case should fairly be attributed rather to her wilful disregard of positive directions than to the instrument. It should serve, however, as a warning.

CASE X.—M. W., aged 33, married, has been under my care at various times during the past twenty years. As a child she was thin and at one time consumptive, but is now robust and healthy in appearance, though somewhat heavy-looking. She is a hystero-epileptic with nymphomaniac tendencies. The uterus was large, dense, and firm; menses scanty and irregular; some ovarian tenderness; complains of headache at monthly periods; is wilful and obstinate. After trying in vain counter-irritation over the ovaries, emmenagogues, salines, etc., I placed a galvanic stem-pessary in the uterus as an alternative, and employed Kidder's battery so as to induce free uterine secretion, and had the satisfaction of seeing her health gradually improve. The stem-pessary was worn for six months. She married, but has remained sterile for over three years; I am watching this case with much interest.

CASE XI.—Sallie C., aged 23, single, child's nurse for several years, was employed in a family under my care. Her mistress informed me that she was moody, especially about the catamenial period and suffered much pain then with frequent hematemesis; she also had headache and seemed, at times, hardly conscious of what she was doing. She was very obstinate and wilful, but took good care of the children. On examination, I found the uterus large, hard, tender, and slightly prolapsed. I treated her also with galvanism at the menstrual period whenever the nismus showed itself; but as the discharge was scanty and irregular, sometimes absent for several months, I placed a stem-pessary in the uterus with marked benefit, though it came away several times. I accused

her of removing it herself, but she assured me it came away when she was at stool. She lost her place, but continued to come to my office from time to time during two years. Having again lost the stem-pessary which I had placed for her, and not bringing it to be replaced, I only galvanized her with Kidder's induced current at her last visit: about three weeks after which, and during my absence from the city, she was seized with an apoplectic attack whilst bathing the child she was nursing. Dr. Hamilton, the child's grandfather, happened to be present, and at once did all that could be done. She was soon after removed to the University Hospital, but never recovered consciousness, and died the next day. The post-mortem showed extensive extravasation of blood into the arachnoid cavity.

CASE XII.—Lucy Maria R., 39, married, but separated from her husband, came under my care in May, 1872. She had been some *seven years* confined to her bed, paralyzed (the result, as alleged, of injury to the spine from a fall); had been under the care of a distinguished physician who had finally given up the case as hopeless. I found her fat, well-nourished, somewhat hysterically emotional, with some tremulousness of the facial muscles, general hyperesthesia with increased reflex action of the legs, able to move them freely in bed or to raise herself on her elbow, but unable to support herself on her feet. There was a sensitive spot near the junction of the sacrum with the coccyx, with a prominence said to be due to the injury above-mentioned. The uterus was large, heavy, and tender, seemingly much congested. I placed her upon the use of ten grains of bromide of potassium night and morning, two grains of quinine thrice daily with meals at regular hours, forbidding any alcoholic beverage, even lager-beer, and inserted a galvanic stem. Under this treatment she rapidly improved; and at first with the encouragement of a helping hand, then with the support of a cane, soon began to walk about. She continued to improve, though she fell several times, apparently from a loss of control or of power in her muscles. She continued to wear the stem-pessary until the uterus recovered normal size and consistence—about three months. Galvanism was then substituted, and a Hodge's pessary left in the vagina. But, about a year after her recovery, she fell and fractured the condyles of the right arm. Her sufferings with this accident were excessive, especially with the manipulation after union of the fragments necessary to restore motion to the elbow, though the angle had frequently been changed during treatment. After one of these manipulations at my office, whither she had walked several squares with her father's assistance, on her return in the street she became suddenly powerless, and was carried home. I was sent for, and found her in bed with some fever and great debility. She died in thirty-six hours, and at the post-mortem, in which I was assisted by Dr. Benjamin Lee, the only thing we could find was an acute softening of the anterior columns of the spinal cord, especially in the dorsal region. An exostosis was found on the sacrum near its junction with the coccyx.

CASE XIII.—Miss A. S. B., aged 46, has been under my care since January, 1878, and writes to me from time to time to let me know of her continued well-doing. When she came into my hands, she had partial left hemiplegia with complete blindness of the right eye; there was a very sensitive spot just below the left mamma, and another in the region of the left ovary. The uterus was large and somewhat sensitive, slightly prolapsed. She was nervously hyperesthetic and emotional, but with good self-control. While examining her with my friend Dr. Lee, I requested her to close the left eye and try to see with the right. The effort brought on a slight epileptiform attack. There is a small scar on her forehead, the result of a wound in childhood from an oyster shell thrown by a playmate. She has been an invalid almost constantly since puberty; was at one time under Dr. Taylor's care in New York for disease of the hip-joint. Menstruation regular, painless, but not abundant: no leucorrhea; bowels much constipated. A sister died of apoplexy at the change of life, and a brother has nervous disease. She was fairly nourished, but the tissues lacked firmness. Recognizing the hysterical element in her condition, I resolved to place a galvanic stem-pessary in the uterus and use faradaism generally, after thoroughly unloading the bowels, which I did by the use of small enemata of flaxseed tea daily, followed in one hour by large ones of warm water. This, with nightly doses of bromide of potassium, and the employment of Kidder's battery, soon effected the happiest results. Dr. Lee also supplied her with a brace to aid the weakened abductors of the left thigh, and she was soon walking about. After about three months of treatment the stem-pessary was withdrawn, leaving only a Hodge closed lever in the vagina. Faradaism had meanwhile restored the function of the right optic nerve; one pole had been placed in connection with the galvanic stem, and the other successively over the semilunar ganglia, upper dorsal region, cervical sympathetic, and facial, infra-orbital, and supra-orbital nerves. Vision returned as suddenly as it had ceased some years before. Once, in the mean time, it had returned for about an hour, and then ceased; but this recovery has been permanent. She is now in the enjoyment, she tells me, of better health than she has ever known before; only coming occasionally for a dose of galvanism. I attribute her recovery to the alterative action of the stem-pessary on the uterus, causing an improvement in its nutrition and circulation, and hence the radiation of a healthy influence to the sympathetic ganglia, instead of a morbid one.

CASE XIV.—Mrs. J. S. H., aged 45, had been suffering for years with retroflexion; was thin, feeble, nervous, and despondent when she came to see me. I succeeded without difficulty in elevating the fundus to its normal position and maintaining it there by the use of a hard-rubber intrauterine stem and a Smith's Hodge pessary; and after keeping her under observation for some weeks, during which she rapidly gained health and strength, sent

her to her home in a distant State, still wearing the pessary. She continued to do so for two years, fearful of a relapse should it be removed; but then allowed her physician to remove it, as she was suffering from some irritation of the vagina. She subsequently returned to see me, when I found only a slight prolapse and some granular erosion of the os; a few applications of nitrate of silver and the use of alum injections relieved this condition, and she has since remained well and in the active performance of household duties.

From the consideration of the above cases, I think we may draw the conclusion that, in the intrauterine stem, properly applied, we have an instrument capable of effecting great good, especially in a number of cases utterly beyond our present means to help without it. I have faithfully given *all* my bad or unsuccessful results, with only a few of the successful ones; my object being to draw out the experience of others, that we may all learn how to do better in future.

I have already described the kinds I am in the habit of using; which have answered my purposes so well that I have not tried others, that have been offered, sufficiently to speak from personal experience. I may, however, add a word in praise of the very neat ones made of hard-rubber by Gemrig at the suggestion of Dr. Albert Smith. They are more slender and flexible than those I have employed, and might consequently be more easily introduced and worn in cases of stenosis of the os internum. Many practitioners have a fear of the glass rods, presuming they might be broken; I have never seen this happen: and would commend them on the score of cleanliness and freedom from any irritating properties. I have not tried Chambers'; the diverging points might imbed themselves in the uterine mucosa and produce dangerous ulceration. Nor have I tried Dr. Graily Hewitt's padlock: the uterus should be free to move laterally and antero-posteriorly in the plane of the superior strait of the pelvis as it does naturally: and its fixation on a firm basis in the vagina would prevent this natural motion. The same objection would lie against Dr. Peaslee's: though there are cases in which this, with a glass ball or disc in the vagina, might prove useful. I do not think the central drainage opening of any advantage: on the contrary, it is more difficult to keep clean, and hence is liable to become offensive.

OBSERVATIONS ON LACERATION OF THE CERVIX UTERI—
ITS ETIOLOGY, PATHOLOGY, PREVENTION,
AND TREATMENT.

BY

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A THOROUGH acquaintance with the literature of this subject, since the first publication by Dr. Thomas Addis Emmet, has shown me that a number of points of greater or lesser importance in the causation, pathology, prevention, and treatment of this lesion appear to have been overlooked by authors. It is the object of this paper to discuss these points and, above all, to endeavor to offer some new ideas on this, of late, so much ventilated subject.

Aside from what was seen during three years' hospital service, eighteen months of which were spent in the Woman's Hospital of the State of New York, these observations are based upon a study of forty cases of labor and thirty-eight cases of lacerated cervix, operated upon by myself in private practice, besides many cases of laceration of the cervix, in which the operation was not a necessity. About one-third of these cases were patients before pregnancy, and I had full opportunity to study the condition of the cervix uteri before, during, and after labor. Twelve of the labor cases had been under my care for uterine disease before pregnancy. In three of these I failed to prevent troublesome lacerations, one of this number has been operated upon, and two now need the operation to effect a cure.

In my practice since 1873, in all cases of labor, a modified form of Listerism has been carried out, and in no instance has there been the slightest sign of puerperal fever or cellulitis. Of the thirty-eight cases of laceration of the cervix uteri operated upon, two among the first had small fistulous openings along the line of the sutures, on account of failure of the edges to heal. One of these finally healed up, and the other gave no trouble. Two cases were followed by renewal of inflammation in old deposits of cellulitis or peritonitis, but were confined to bed less than

three weeks. One recovered entirely from the effects of the inflammation in eight months, the other in twelve months, and both have realized the good results of the operation. So far as curing the laceration, all may be called successful; but in several I failed to remove all of the diseased tissue, and in others left the cervix so long that afterward retroversion necessarily existed.

I have seen three of those operated upon that have since borne children; in all, the cervix remained intact, and I detected no apparent change, except that in one case the cervix was flattened out, but was healthy. One patient is now pregnant, who became so two months after both the cervix uteri and the perineum were sewed up. She is forty-two years old and has not had a child for nine years, during which time she has been a great invalid. Four cases of extensive laceration of the cervix uteri are now undergoing preparatory treatment. One of these I saw first when only six weeks pregnant. She had been ten years married, and never before pregnant. The cervix was hard, long, pointed, and sharply flexed on the body of the uterus. I afterwards delivered her, but could not prevent a laceration. The second is a delicate woman who gives a clear history of catarrhal disease of the cervix before the birth of her two children.

The third was under my care for a uterine fibroid about the size of an orange. A sponge-tent was introduced to dilate the cervix and was followed by an extensive abscess on the upper surface of the fibroid, which was submucous; this, by distending the uterine cavity, induced a rapid spontaneous expulsion and caused a laceration of the cervix uteri.

The fourth claims to have been perfectly healthy before the birth of her first child. At its birth, she was without medical attendance and was thirty hours in labor.

The history of laceration of the cervix uteri is of so recent a date, and the credit is so universally conceded to Dr. Thomas Addis Emmet for making known its importance and describing a simple and effective means of cure, that I will not here enlarge upon this subject.

Etiology.

Occasionally we will find a lacerated cervix caused by a uterine dilator or the forcible extraction of a large fibroid tumor

through the cervix, but it is during the birth of the child that laceration of the cervix commonly takes place. Labor is almost always the immediate cause; but there are other predisposing causes which, from observation of a number of cases, I am satisfied are of great importance.

I will first mention some general causes which may predispose to laceration of the cervix.

It is claimed by some that in this country, to a much greater extent than in any European state, the intellectual faculties are more generally forced to develop at the expense of the physical strength. If this is true, we may have the cranium become relatively larger than the pelvis and thus have more lacerations of the cervix. We do have in this country a great intermingling and consequent intermarriages between races widely divergent. It is a well-known fact that the mulatto, produced by a cross between a negro and an Anglo-saxon, is a very poor specimen and soon dies out, whilst a cross between a negro and one of the Latin race produces a much better stock, but still inferior in strength and in health to either parent race. This law, in races much more nearly alike, has, I think, much to do with the production of some of the feeble and ill-balanced part of our population. Besides, where races with relatively different sized, or even differently shaped heads, as, for instance, one being long and flat, the other round, intermarry, many of the children may have heads too large, or so shaped that they do not conform readily to the pelvis and cannot pass the cervix uteri without rupturing it. The great vitality of the Hebrew race may be accounted for by the fact that there are so few hybrids among them. Again, intermarriages of near blood relatives do, as a rule, result in imperfectly developed and unfinished children; and among the well-to-do class, where these creatures are able to reach maturity, tends to increase uterine diseases and deformities of the pelvis. What I most desire to draw attention to, are the abnormal conditions of the cervix uteri itself and adjoining tissues, which act as important predisposing causes of laceration. Some of these are:

1st. Imperfect, or abnormal development of the cervix, either supra- or infra-vaginal. 2d. Flexions of the cervix. 3d. Induration, or loss of substance of the cervix. 4th. Diseases of the mucous membrane, or other parts of the cervix. 5th. Induration and contraction of the ligaments attached to the cervix.

6th. Deformities of the pelvis, or tumors that displace the cervix.

As a rule, a diseased or abnormal condition of the cervix will prevent impregnation, but there are many exceptions. Among civilized people, where the law of "survival of the fittest" is interfered with, many girls with inherited feeble organizations reach and pass puberty with unfinished, imperfectly developed genital organs. When one of these becomes pregnant by a large and vigorous man, the cervix will, in all probability, be incapable of dilating sufficiently to allow the child to pass without tearing. Then there are others, who, from sickness, bad hygienic conditions, or from other circumstances, are compelled to use up the force that should go to develop the genitals, reach maturity with imperfectly-developed organs. Among this class, very few escape having subacute catarrhal disease of the throat, and many of them have a similar disease of the mucous membrane lining the cervix uteri, its follicles and glands are diseased, and in some cases the underlying tissues are hardened and flexed. Of course, many of these cases reach a point where impregnation will not take place; but in others, later, the general health improves and the local disease subsides sufficiently to admit of impregnation, yet not before serious structural changes have taken place in the cervix. Even in cases where the disease is present, just after a free menstrual flow, the secretions may be for a time nearly normal and impregnation will take place and the mucous lining of the cervix continue diseased throughout the period of pregnancy. Such cases are very sure to tear during labor; and even when the laceration is comparatively slight, may be very troublesome.

In cases where there is induration and flexion of the cervix, pregnancy is rare, but does sometimes take place even when the cervix is hard, small, pointed, and sharply-flexed, as I have seen. From some observations lately made by examining patients just before, during, and after menstruation, I am satisfied that in some instances, even where the flexion is very decided, it is not constant during the whole month, and at times the uterus will be found straight. Besides, we do not know how orgasm may influence a flexed uterus. Now, when one of these cases with a small and hard or a long bent cervix does become pregnant, the cervix will soften in a great measure before labor, but does not always become soft and perfectly normal. Even when it

does soften, the tissue that has never developed or has undergone atrophy is still missing, and the cervix will be relatively feeble and small.

In cases where the cervical tissue is hardened or is deficient from the effects of a syphilitic ulcer, or hardened and cicatrized by escharotics, the mucous membrane and deeper tissues are very apt to tear, even where the labor is normal in every other respect.

Any disease, as cancer, which affects the structure of the cervix, may be a predisposing cause to laceration during labor. Placenta previa, by softening and rendering more friable, may influence laceration of the cervix, aside from necessitating a hurried labor.

Usually, extensive cellulitis or peritonitis prevents impregnation, but we do see cases become pregnant where the cervix is drawn out of position by the contraction of ligaments due to local peritonitis or an abscess. The change that takes place during pregnancy may restore this tissue to a normal state, but it does not always do this, and when the head descends upon the os, one part of the cervix is held up, while the other is carried down, and thus laceration is caused. Besides, if this contracted condition reaches the tissues of the cervix, its elasticity is decreased. When a laceration does begin in an abnormal cervix, the pain caused, even where only the mucous membrane is torn, may be so severe as to greatly add to the voluntary efforts at expulsion, and, at the same time, materially increase the intensity of the uterine contraction, and thus cause a deeper laceration by rapid distention.

The immediate causes which tend to rupture the cervix during labor, even though the condition of the cervix is normal, are:

1st, abortions and premature labors, *where delivery takes place soon after labor begins*; 2d, a rapid labor or one in which the *presenting part quickly dilates the cervix*; 3d, early rupture of the membranes; 4th, dry labor, where the amount of fluid is very small; 5th, retarded or protracted labor; 6th, instrumental labor; 7th, abnormal presentations, especially where delivery is manual; 8th, an abnormally large fetus or head.

After impregnation, the cervix undergoes a change, and very soon becomes larger and softer, and for several weeks or days before labor, still further enlarges and softens, being evidently

a preparatory condition to enable the cervix to dilate to the greatest extent, and allow the head to pass without rupturing. Now, in cases of abortion and premature labor, unless they are retarded, the cervix will be dilated before it has had the advantage of this preparatory stage, and thus even a comparatively small fetus may cause laceration. Dr. Emmet claims that criminal abortion is very often followed by laceration. I think this is due to the fact that these cases are usually effected by rupturing the membranes, and, thus, the more or less solid and irregular and dry fetus and membranes come directly against the cervix, unprepared for dilatation, and instead of efforts being made to somewhat retard expulsion, as is usually done in cases of abortion from other causes, the delivery is hastened, and thus the cervix is much more likely to be torn. Besides the softening that takes place before labor begins, each pain gradually stretches the os, which undoubtedly, during this time, undergoes changes, aside from being merely stretched; for immediately after labor it is much larger and its tissue softer than just previous to labor. Where the presenting part is rapidly forced through the cervix, not giving time for these changes, rupture is likely to occur.

In normal labor, the smooth elastic bag of waters gradually, with pressure evenly distributed, dilates the cervix; but in cases where the membranes are ruptured early, the more or less irregular and rough head comes directly in contact with the cervix, and is much more likely to tear it; besides, if labor is retarded, the parts soon become dry and sticky, and further add to the likelihood of rupture. For the same reasons, in dry labors and in cases where the fluid is too scant to act as a dilating pouch and to keep the parts lubricated, there is likely to be a laceration.

The cervix requires a certain time to get soft and elastic, but if labor is long retarded, the tissues of the cervix will become *dry and edematous, and to a considerable extent lose their elasticity*, and are likely to be torn. In such a case, one side of the cervix may catch or stick to the head and be carried downward, while the rest of the cervix slides upward, and thus necessitates greater dilatation to allow the head to escape. Besides, in retarded labor, the liability to inflammation is increased, and this may make a slight laceration become a very serious affair. In retarded labor, any cause which compresses the cervix be-

tween the presenting part and the bones of the pelvis may injure the tissues of the cervix, so that, when further dilatation does take place, it will rupture at this point, and may allow the fetus to be expelled from the uterus without its passing through the external os.

The cases where the tear begins above the external os, or where there is sloughing caused by pressure, are those in which fistulæ are apt to complicate the case. In these cases, the rupture takes place when the head is well down in the pelvis and has carried the more or less undilated os with it; and I believe that some of these cases, where the cervix is carried before the head, as it were, are caused by an abnormal condition of the tissues that unite the cervix with the body of the uterus, which condition may be due to either congenital or acquired weakness of this part.

Instruments, when judiciously and skilfully applied, ought more often to obviate laceration of the cervix by preventing or modifying retarded labor than cause it. Yet, when improperly applied within the cervix, or when they are used to forcibly and quickly drag the head out of the cervix, they may cause very serious lacerations. Unusual or abnormal presentations which cause the presenting part to be irregular, or necessitate manual labor (especially those in which the membranes are early ruptured), may cause laceration; a monster or a very large head may necessitate a laceration in delivering.

Diagnosis.

The diagnosis of laceration of the cervix cannot be made until the child is delivered, and then the accident is not always easily detected on account of the softened condition of the parts. A steady stream of arterial blood keeping up, when the uterus is known to be firmly contracted, is, perhaps, the most reliable indication that there is a serious rupture of the cervix. Aside from physical examination, the next indication would be a continuance of the lochial discharge much beyond ten days. One of three things would be indicated by this—a very bad general condition, retained placental tissue, or a lacerated cervix. After the patient was up and about, beyond profuse discharge and perhaps some blood or discolored discharge, there would be no symptoms different from those produced by some form of displacement, and later on those caused by disease of the mucous

membrane of the cervix, and only physical examination could make the diagnosis certain. It is usual to examine first with the index finger of one hand in the vagina, and the other hand on the abdomen. In a recent case of a few weeks' standing, the finger readily distinguishes the soft edges of the wound, and makes out the depression caused by it. Usually the parts would be so movable as to allow the finger to pass to the depth of the tear, and the uterus could be felt above. In cases complicated by cellulitis or local peritonitis, there would be tenderness and more or less extensive induration and immobility of the parts.

Later the tissues would evert and become harder, and in cases where the involution of the body has taken place, the cervix would be felt to be larger than the comparatively small and firmly rounded body of the uterus. Much depends upon the amount of induration and eversion as to whether the case could be clearly diagnosed with the finger; whether it is a single or a double laceration; if single, which side is lacerated, etc. For making further examination, a Sims' speculum, two tenacula, a flexible sound and depressor are the instruments needed. By putting the patient in Sims' position, introducing the speculum, and bringing the cervix into view, in a recent case, the ragged edges of the tear, its direction and extent are readily made out. But in cases of long standing, where the tissues are hardened and everted, it is not always easy to make out the side that is lacerated, and, if double, which side is most torn, etc. The whole surface may be so flattened out that the line of the tear is apparently very shallow, or so covered with granular erosion as to be difficult to determine. In some cases, distended and burst cysts can be both seen and felt. In some, erosion is extensive; in others, only a small line or spot is broken, and especially in very old cases, all except this small line or spot being hard, tense, and bluish, with usually several round nodules formed by diseased cysts, filled with a thick, tenacious, gummy-looking fluid. With few exceptions, the sound will measure more than the normal depth. In many cases, the uterus is prolapsed and retroverted; in others, flexed.

Cases of subinvolution, caused by retained placenta or other influences, may be mistaken for laceration when the cervix is enlarged and flattened.

Where the laceration is slight, or filled with eroded granulations, or in cases where the latter are extensive, it may somewhat

resemble malignant disease of the cervix. Rest in bed, with the use of hot-water vaginal injections, will soon make differential diagnosis easy. Some of the cases where the cervix presents an irregular and apparently fissured condition, that are supposed to be cases of slight laceration which have healed, are, in fact, merely folds and wrinkles in the mucous lining, caused by its failing to resume its former shape after once being greatly stretched.

There seems to be a superabundance of mucous membrane in such cases. This may be due to the existence of disease of the mucous membrane, or to its failure to undergo involution to the same extent as the muscular tissue. It is in this way that a very slight laceration may give much trouble, and by eversion give the impression of an extensive laceration. Cutting out the diseased tissue and bringing together healthy edges readily cures. After the diseased tissues are cut out with a sharp knife, the sutures should be put in with the greatest care, for the deeper muscular tissues are not always involved in the wound, and may be thrown out of proper relation with the opening left in the mucous membrane when sutures are used.

I have also seen cases where the whole cervix seemed flattened out and much shortened up, yet no signs of laceration could be found sufficient to account for the everted condition of the mucous membrane, and I think this is due to the fact that many of the circular fibres had been torn or had been so stretched that they never afterward recovered their power, as is sometimes seen in the sphincters of the rectum, and, on this account, the mucous membrane was too abundant, and was everted in proportion to the shortening of the cervix.

If previous to pregnancy the cervix was long, after labor when involution takes place, the muscular part of the cervix might shorten considerably even when not ruptured, and thus leave a protruding and everted mucous membrane.

The line of laceration through the mucous membrane does not always indicate the full extent and depth of a laceration, especially in very old cases, particularly if they have been treated for "ulceration" in years or months past, for the mucous membrane may not have been torn, or may have healed, leaving some deeper tissue ununited, or have been sufficiently destroyed to force contraction of the mucous membrane, and cause it to slide down and cover the deep laceration in the muscular tissues

above. Except in cases where the mucous membrane is diseased, or in those where the cervix is abnormally long, *a laceration not extending, when first torn, to the vaginal junction, or even higher internally, rarely gives trouble, unless complicated by inflammation, etc.*

Pathology.

Why is it that lacerations of the cervix are so commonly found to be through the lateral, and comparatively rare through the anterior and posterior walls? It is said by some that lacerations posteriorly and anteriorly do occur as often, if not more frequently than lateral lacerations. I am satisfied that there are very good reasons why lateral lacerations are much more frequent than those of the anterior or posterior walls. First, the longest diameter of the pelvis at the brim is transverse, and, therefore, the longest diameter of the head is directed transversely; besides, the position of the bladder and the rectum tend to further shorten the antero-posterior diameter, and thus make the transverse position of the head more fixed.

Second, the position and attachments of the ligaments of the uterus have much influence in causing the laceration to be lateral. The uterus lies between folds of the peritoneum and fasciæ, and these, together with the ligaments, are firmly attached anteriorly and posteriorly, and not to the same extent laterally, where these tissues separate to allow access of the blood-vessels, lymph-ducts, and nerves to the uterus. Especially is this true of the lower portion of the organ, where the utero-vesical and utero-recto-sacral ligaments are attached. These ligaments give to and receive from the uterus fibres of muscle and other tissues, which tend, not only to strengthen greatly the anterior and posterior walls of the cervix, but also to hold up and forward the anterior lip, and to hold upward and backward the posterior lip against any downward force beyond a limited extent.

Third, the position of the rectum and bladder, aside from helping to direct the long axis of the head transversely, are, in a measure, supporting-pads to the anterior and posterior walls of the neck when fully dilated, and thus help to prevent laceration anteriorly or posteriorly, except in rare cases, where the lower part of the cervix, not being fully dilated, the upper part is forced so firmly and persistently against the pubes as to cause

death of tissues and sloughing or weakening of the tissues, so that they tear when further dilated by the passage of the head.

Fourth, the structure of the muscular walls of the cervix is such as to favor the anterior and posterior walls. The cervical canal is wider transversely than antero-posteriorly.

The reason why the laceration is more frequently found on the left than on the right side is, that the uterus is normally suspended in the pelvis with the fundus slightly to the right and the cervix slightly to the left side, and this position causes the impact of the presenting part, which is, in the large majority of cases, the occiput, to be deflected more strongly toward the left than to the right side.

Lacerations involving both sides of the cervix are quite frequent, but I cannot remember ever seeing one in which both the anterior and posterior lips were torn. In a rapid labor, it would seem that double lacerations may be caused when the cervix is dilated and greatly thinned out by both sides giving way simultaneously. Or, in retarded labor, where the anterior and posterior walls of the cervix are pinned against the pelvis, the tissues being edematous and dry, are not able to slip from side to side, and each lateral segment is torn either at the same time or separately.

In studying the changes which occur after laceration of the cervix, the subject is simplified by taking into consideration that the cervix is composed mainly of three tissues: 1st, the mucous membrane with its glands and follicles; 2d, the connective tissue (in which are some muscular striæ) and fasciæ that bind all the other parts together, and projecting out between the folds of the peritoneum from the points of attachment, and to a great extent make up the ligaments that support the uterus; 3d, the deeper muscular tissues of the cervix (mainly circular). Besides, the condition of the tissues at the time of being torn must also be taken into consideration, for the pathological changes are greatly influenced by this condition.

When the muscular fibres are torn, the connective tissue, and almost always the mucous membrane, is ruptured; but the muscular fibres may give way and tear apart beneath the mucous membrane, just as is the case sometimes in the perineum. The rent in the mucous membrane may be very slight compared with the tearing of the deeper tissues. After laceration of the muscular tissues during labor, as many of the fibres are circular and are

retracting, there will be a tendency of the edges to gape, and this tendency is kept up by the process of involution. The vagina is itself enlarged, and it must undergo involution before it could exert much influence in keeping the edges together, yet the resiliency of all the tissues surrounding, produced by atmospheric pressure, does tend to hold the edges together; but even when kept perfectly clean and uncomplicated by cellulitis or too early getting up of the patient, the union of all the muscular fibres would hardly be secured, and in extensive laceration there would be more or less of a notch left which may disappear later by being flattened. Many cases when uncomplicated do heal up to such an extent that they cause no trouble. Now in cases of imperfect development, or in those where previous disease has caused atrophy of the muscular tissue, once being torn apart, the rent does not unite when left to nature, even though all the circumstances are favorable.

The connective tissue is involved to some extent in most lacerations, but produces bad results mainly by becoming the seat of inflammatory infiltration. And in complicated cases it becomes an important factor.

The mucous membrane is more or less torn, in the majority of labor cases, and when healthy and uninfluenced by underlying cellulitis heals, leaving only very slight notches or scars. In a case of granular erosion, or one with a cervix filled with diseased cysts, feeling like so many imbedded shot, pregnancy may occur; be as careful as you may, yet in delivering you are pretty sure to have a ruptured cervix on hand when the head passes. You may have an extensive rupture, but even a slight laceration, where little more than the mucous membrane is involved, may prove troublesome, and the swollen, everted, and eroded membrane will not heal satisfactorily unless you cut away the diseased tissue and bring the edges together with sutures. In many cases of long standing, it is not easy to determine to what extent the different tissues have been torn, unless the parts are first softened by constant pressure made by tamponing. In cases where extensive subinvolution still exists, the tampon will merely flatten and soften the neck; but in cases where the body of the uterus is small and involution is more or less perfect, the tampons create a very great change. By the touch, the firm, hard, muscular tissue is felt to be little larger than when normal, and the gaping edge of the notch caused by

the laceration can be plainly made out. The mucous membrane has lost its dull bluish color, it is redder and much softer, showing plainly the line of laceration with its granular, broken-down edges. The connective tissue has lost its infiltrated matter and allows the stretched and superabundant mucous membrane to slide about with the greatest freedom. In this state operate, and it will be plain to you that the dense gristly tissue which has broken so many needles for us is in reality not cicatricial tissue, but often, if not always, the close, firm muscular or elastic fibres of the cervix, perhaps somewhat hardened by hyperplasia of the connective tissue. One has only to attempt to pass a thick short needle through the normal deep muscular tissues of the cervix to be convinced how hard and tough it is. While the tissues are softened in this way by tamponing, you will readily see the reason why the depth of the uterus is frequently shortened by an operation which it would seem should lengthen the canal. The infiltration or induration of the mass of connective tissue which separates the mucous membrane from the muscular tissue is eliminated. In other words, the sutures tend to approximate the muscular tissues and the mucous membrane, and thus shorten the depth of the canal.

In cases where there is much subinvolution, the shortening of the canal is not so evident just after the operation, but appears later, being due to the influence of the operation in inducing completion of involution. There is no doubt but that, next to the removal of diseased tissue, the stimulative effect of the operation upon this dormant power of involution accounts for the remarkably beneficial effects on the health of the patient. In the same way, a relaxed subinvolted condition of the vagina and perineum may be cured by an operation on the perineum barely torn at all.

What causes eversion of the tissues when the cervix has been lacerated?

1. The condition of the cervix at the time that it is torn.
2. Increase in size from congestion, infiltration, or hyperplasia of the soft and vascular mucous membrane and of the connective tissue in and near the laceration.
3. Cystic degeneration of the glands and follicles of the cervix.
4. Swelling or thickening or contraction of the adjoining connective or peritoneal tissue which *interferes with the circulation* of the cervix or puts upon the stretch any ligament attached to it.

5. While in the upright position, if the uterus sinks low in the pelvis, the pulling apart of the surfaces of the laceration by the suspensory ligaments.

6. Under certain conditions, pressure on the posterior wall of the vagina and underlying parts or floor of the pelvis.

7. Displacements of the uterus.

If at the time of the laceration the tissues of the cervix are inflamed or diseased in any way, the tendency to repair is interfered with, and the likelihood of inflammation and swelling very much increased. After labor, the cervix must undergo involution to return to the normal size of an unimpregnated uterus. If the parts are healthy and the conditions favorable, repair may take place more or less perfectly; but if, on account of existing disease of the mucous membrane or on account of irritating or poisonous discharge, the repair is delayed, then the process of involution has much to do with eversion of the tissues. Involution of the parts involved in the tear would be retarded and they would remain large, while the body of the uterus and a part of the tissues of the cervix would undergo contraction, and on account of the muscular fibres being circular, with others running from the body to the cervix, their contraction would tend to squeeze out of the canal the soft and swollen tissues of the line of laceration and greatly interfere with its circulation. In cases where subinvolution is more general, as this adds weight to the organ, the tendency to eversion would be increased when the patient is in the upright position.

In a normal cervix, when intact, the lining membrane is under gentle pressure which is removed by laceration, and thus swelling may take place unless repair occurs rapidly. When the continuity of the tissue is destroyed and swelling takes place, the swollen tissues will protrude in the direction of least resistance and thus cause eversion, and it is on this account that inflammation which causes congestion and infiltration adds greatly to the eversion, at the same time increasing the weight of the parts. Cystic degeneration causes swelling of the mucous membrane and consequent eversion. Cellulitis and infiltration in the adjoining tissues often puts the uterine ligaments greatly on the stretch and thus leads them to pull open the wound, or by obstructing the circulation causes increased swelling and eversion. If the cellulitis chiefly involves both broad ligaments, the eversion may not be so great, but the cervix will gape widely (is

funnel-shaped) and gives the impression that it is torn internally much more than externally, that is, that the inner layer of muscular tissue is chiefly involved. Contraction after local peritonitis or an abscess, when it shortens a ligament attached to the cervix, will also pull open the wound. Fibroid and other tumors may influence eversion.

After laceration during labor, usually in a short time, the uterine ligaments return to their former condition, and when the patient is in the upright position—if for any reason, such as straining at stool, the uterus sinks in the pelvis—the ligaments attached to the cervix would tend to pull apart the lacerated edges, and would act more powerfully in proportion to the weight of the organ and the extent of the laceration. As the principal points of attachment of these ligaments are to the anterior and posterior walls, the eversion caused by this force is greater when the laceration is lateral. (Some muscular fibres and fasciæ that go to make up the ligaments extend down into the infra-vaginal part of the cervix.)

When from too early getting up of the patient, or in cases where subinvolution extends to the ligaments, or when from any cause the uterus is prolapsed and not retroverted to great extent, the lacerated cervix would be flattened out and irritated by its own weight, pressing the cervix against the posterior wall of the vagina and the underlying tissues which form the floor of the pelvis. In such a case, where the uterus is somewhat anteverted, this pressure is more or less evenly distributed on both the anterior and posterior flaps, but when the uterus tends to deviate backward from the normal position, most of the pressure is on the posterior lip, while the anterior lip is free to extend down the vagina. This in some cases accounts for the disproportion in the length of the two flaps not uncommonly met with. Now, when there is complete retroversion, both flaps slip down the vagina as far as the ligaments will permit. When in this latter position, if the patient keeps in the reclining posture, the eversion will decrease, but when upright, the suspensory ligaments will in time cause marked eversion.

Except in cases where involution of the vagina is very rapid compared with that of the lacerated cervix, I cannot see how it can influence the condition of the cervix. It is a soft flexible tube, and when not distended, its anterior and posterior walls are in contact. If the vagina is small and the lacerated cervix large

enough to distend its walls, then, of course, the shape of the cervix might be altered by the vagina. But after labor the vagina is large, and when the uterus is prolapsed, the capacity of the vagina is very much increased and would not be likely to greatly influence the shape of the cervix.

The influence of displacements on the cervix uteri after laceration.

In antelexion, as the fundus bends forward it puts on the stretch the posterior wall of the uterus, and in time this force shortens the deep layer of muscular fibres of the posterior lip of the cervix. At the same time, the mucous membrane and more superficial connective tissue is held down by the vaginal attachments, and this prevents much eversion. While this change is taking place in the posterior lip, the anterior wall of the uterus bent on itself is crowded down and the anterior lip of the cervix is rolled out in marked contrast with the posterior. The ligaments attached to the anterior lip of the cervix resist the tendency of the cervix to go backward and upward when the body is antelexed, and this also increases the eversion of the anterior lip.

Now, when the uterus is retroflexed, the posterior lip is not pushed out and everted to the same extent as the anterior would be by antelexion, for as there is more or less prolapse, the cervix comes in contact with the curved floor of the pelvis posteriorly and is thus kept back, or if it slides down the vagina, the flexion is straightened out and retroversion and prolapse take the place of retroflexion. Anteversion has much the same influence as antelexion, and retroversion the same as retroflexion.

Prolapse of the uterus from its own weight, when the cervix is deeply lacerated, causes marked eversion by the ligaments pulling back the two lips. But when the uterus is pulled down by traction on the lower end of the vagina, the tendency may be to slip the mucous membrane and superficial tissues off from the deeper layer and obliterate the line of vaginal junction with the cervix. Displacements, especially prolapse, of the uterus greatly interfere with the normal circulation of the organ, and the swelling caused by this increases the eversion of the lips when the cervix is lacerated. Laceration occurring in an elongated cervix, even when uncomplicated by the slightest signs of inflammation or subinvolution, often will not heal, yet give no trouble after labor until displacement takes place, as the result

of the cervix still being too long to remain in a normal position, or of a lacerated perineum. As the uterus sinks in the pelvis, swelling begins, and soon the lacerated cervix everts, etc. I have watched just such a case through every stage and expect to cure it only by removing a part of the cervix and sewing up the tear beyond where I amputate the cervix.

Some of the same causes which produce eversion, by obstructing the circulation and by irritation, keep up and intensify any existing disease of the mucous membrane. This prevents the process of repair from exceeding or being equal to the waste or death of the tissues and thus causes erosion, diseased glands and follicles, and faulty secretions, and in some cases a hyperesthetic condition in the wound, which by reflex action greatly disturbs the health of the patient. I cannot accept Dr. Emmet's theory, that it is a "cicatricial plug" which causes this hyperesthetic state. It seems to me to be a condition similar to what is found in other portions of the mucous membrane where there certainly is no "cicatricial plug." I refer to sensitive spots that I have found in the cervix of virgins, in the female urethra, and in the prostatic portion of the male urethra—points that were equally sensitive and produced very similar reflex disturbances. Undoubtedly the pressure caused by infiltrated tissue, or the contraction of cicatricial tissue on terminal points of nerves, may have a bad effect, but in many of the cases most influenced by reflex disturbances the induration is slight and no scar formed. Imperfect nutrition or prolonged irritation would seem to be more directly a cause of this hyperesthetic state than pressure from a scar. Interrupted pressure, such as may be induced by irritating a sphincter muscle, may increase or even start up such a condition, but steady pressure causes death and atrophy rather than disease.

I do not claim that there is no cicatricial tissue in the angle of the wound, but that there is no "cicatricial *plug*" at the bottom of this angle. Such an idea comes from the old and erroneous belief that a deep open wound "fills up with granulations." These wounds do close up, either by the edges becoming depressed or by the adjacent tissue being drawn into the space, but, "the granulations and the scars of deep open wounds remain alike thin and depressed" (Paget). This is equally true of a lacerated wound of the cervix. A scar may be there, but no plug of that nature. What by some is supposed to be a "cicatricial

plug" is the firm, hard muscular tissue, perhaps somewhat changed by hyperplasia of the connective tissue, covered by an old scar with more or less mucous membrane drawn up over it at the angle. In old cases, the epithelium of this mucous membrane may be very much thickened by prolonged irritation, and there may be hyperesthetic nerves somewhere beneath it, but we could no more call this a cicatricial plug than a clavus (corn). (May it not be a clavus of the mucous membrane? One of the functions of the mucous membranes is to protect the underlying tissues. May not this thickened epithelium be a functional hypertrophy?) Scars are hard, but they are thin, and deep cutting of the angle is not necessary to remove the cicatricial tissue; but since the deeper circular muscular fibres when torn retract, in time, when the edges are flattened down, the sides of the wound are no longer the straight lines of an angle, but are the curved lines of an arc and cannot well be brought into apposition without using considerable force, unless the sides are first made straight by cutting out a triangular piece at the centre of the wound. This triangular piece may be covered by a scar, by granulations, or by mucous membrane, but it is not a "cicatricial plug." It would indeed be a serious matter to go to work to cut all the hard tissue at the bottom of the wound.

When the cervix is divided with a knife or a pair of scissors, as this makes a smoother surface than when torn apart, and is usually done while the cervix and uterus are small, eversion and its attendant results seldom ensue. But, if the operation is followed by inflammation, or if the mucous membrane is diseased, there may be eversion and erosion, etc. Much depends upon the extent of the tissues cut, whether all the tissues of the cervix up to the vaginal junction are cut entirely through, or whether only the inner muscular layer, in which lie most of the circular fibres, is divided, and the mucous membrane is cut only just slightly beyond the crown. The latter can be done thoroughly with Sims' uterotome, and is just as effectual and is little likely to be followed by eversion.

Prevention of Laceration of the Cervix.

From the success that I have had in the last twelve cases of labor, I am satisfied that much can be done toward prevention of laceration, and when it must occur, as is often the case, the extent of the laceration may be limited, and the serious after-

effects prevented in almost all cases by treatment before and close attention during labor.

When a woman becomes pregnant, it must not be taken for granted that the neck of the uterus is perfectly healthy, or if it is in good condition at this time that it will remain so throughout pregnancy.

Morning sickness to a moderate extent may occur without any perceptible disease of the cervix, but, as a rule, it is a pretty certain indication that there is an unhealthy condition of the neck of the uterus. For several years past, I have not seen a single case of this distressing condition that did not yield in a few days to local treatment, while several of my cases were not helped by the usual remedies.

If, during pregnancy, there is nausea, leucorrhea, or any indication of disease of the cervix, an examination should be made and the case treated, not only to relieve the symptoms, but in order to get the neck of the uterus in a healthy condition before labor.

The danger of inducing an abortion by treatment is by no means as great as I at first supposed it would be, and I think that with reasonable care many more cases of abortion and premature birth could be obviated than would be caused by the treatment. Applications can be made to the cervix and for at least three-fifths of an inch within the canal, and tepid vaginal injections can be safely used during pregnancy.

For the relief of nausea, I have found dilatation of the canal for three-fifths of an inch to be, so far, perfectly successful in relieving this symptom and in softening the hardened condition of the cervix so commonly associated with, and perhaps causing the vomiting. Sometimes the index finger introduced to the first joint will answer, but in many cases, especially in primiparæ, it is very difficult to get even the point of the finger into the cervix. I now use a modified uterine dilator bent nearly at right angles, so that not more than three-fifths of an inch can enter the canal; it is opened by a screw adjustment which enables you to regulate the extent of dilatation, and its shape makes it easy to introduce it even when the cervix is, as it often is, very high and far back in the pelvis. In some cases, there will be slight hemorrhage after even moderate dilatation, and usually one dilatation completely relieves all vomiting. After dilatation, the neck soon becomes shorter and much softer.

I caution my patients when pregnant to be careful, at the time that they would expect to have their menses if not pregnant, and to be especially careful if any of the usual premonitory symptoms should become manifest, for I am satisfied that at this time abortion or premature labor is most likely to occur.

If not successful in correcting any trouble of the cervix, and there is any discharge, vaginal injections are to be used, and for some days before labor is expected antiseptic injections are used once a day. In all cases I have the nurse come early, and if these carbolyzed injections are not used before, one is given at the first indications of labor beginning, and everything must be in readiness for the carrying out of a somewhat modified form of Listerism during and after labor, until the discharge ceases. And an examination is carefully made of the cervix and uterus before the patient is allowed to sit up. If obstetricians would take as much pains to prevent laceration of the cervix uteri as they do to prevent laceration of the perineum, much would be done toward obviating this accident. They should avoid rupturing the membranes until it is absolutely necessary. In a rigid os, carefully and slowly assist dilatation with elastic dilators. In dryness of the parts, freely use lubricants. When the pains are very powerful, and the voluntary efforts at expulsion violent, the latter should be controlled, if necessary, by chloroform at the time of the head passing the cervix, and one or more fingers be kept against the head, and an effort made to regulate and modify the more violent efforts at expulsion. Sometimes an opportunity will be found to help the cervix over a part of the head, where it is retarded more than at other points.

It is true that many cases of lacerated cervix give the history of forceps being used, but this may be due to the fact that those conditions which necessitate the use of forceps are often the same in which a laceration of the cervix would take place whether the forceps are used or not. To avoid lacerating the cervix by the use of forceps, it is well to dilate the cervix as much as can safely be done before they are applied, to decide as early as possible that forceps are necessary, and to handle them skilfully, adjusting them accurately, and pulling steadily and in the right direction and at the right time. Forceps, timely and skilfully applied in retarded labor, often prevent sloughing and some of the worst forms of lacerated cervix.

Sequelæ and Complications.

Hemorrhage; subinvolution; endometritis; erosion of the everted lips of the cervix; cystic degeneration of the mucous membrane; displacements of the uterus; inflammation of the connective or cellular tissue, and adjacent peritoneum; rupture of the perineum; fistulæ; malignant disease of the cervix; cicatrices the result of treatment with escharotics or prolonged and frequent use of powerful astringents; venereal disease.

The effects of most of these have already been shown, and they will be further considered under the head of treatment.

Treatment.

As a rule, uncomplicated lacerations occurring in a healthy cervix will heal so as not to need special treatment, provided the parts are kept clean and the patient remains in the reclining posture for two weeks or more.

When severe hemorrhage is caused by laceration of the cervix, the wound should be sewed up at once. In other cases, as a rule, it will be better to keep the patient in bed and use anti-septic vaginal injections, and allow Nature to heal the wound as far as she will. After the patient has fully recovered from the effects of her labor, allowing full time for involution to take place, if on examination a decided laceration exists, it should be sewed up without further delay, unless for some good reason the operation is contra-indicated. If the cervix is sewed up before the patient is much on her feet, not only will the laceration be cured, but all the sequelæ that may follow a lacerated cervix are prevented; whereas, if we wait for symptoms to indicate treatment, as these symptoms are the result of some complication—a displacement, inflammation, or some other serious disease—a complete cure is by no means certain, even by the best treatment. It is true that the laceration can be cured, but the displacement may necessitate the use of a pessary until the uterus is atrophied by old age. Besides, the bad effect of uterine disease upon the general health of the patient may become permanent.

Unless the laceration is sewed up just after the accident, when the edges are fresh, it will be better to wait until involution has had time to take place; usually six weeks' time is amply sufficient. After this, paring the edges and sewing up

the wound is not only the best way of curing the laceration, but the subinvolution that may exist at the same time.

Inflammation of the endometrium, or granulations extending above the point of laceration, should, as a rule, be treated before the wound is closed. Extensive erosions of the everted lips of a lacerated cervix should be treated by rest in bed, hot-water vaginal injections, and, if associated with induration of the cervix or adjacent tissue, pressure, with carefully graded tampons, should be made, and, in case of the surface being so sensitive as to bleed when touched, astringents should be used, but not oftener than twice a week. After this is cured, if a distinct laceration exists, it should be sewed up to prevent a return of the trouble.

Cystic degeneration of the follicles of the mucous membrane is a common result in an old laceration of the cervix; and when it is of long standing, to effect a permanent cure an operation is necessary, for the trouble is so deep-seated that applications alone do not reach it unless they are strong enough to actually destroy the tissue. When the erosion is treated by caustics, a hard, tense scar is the result, and is pretty certain to give way and cause a sensitive, irritable ulcer.

Lacerations of the cervix are frequently complicated by displacements of the uterus. The laceration may be indirectly the cause of displacement. By adding to the weight, it may cause prolapse, or by causing uterine chronic disease, it may induce flexion or version. In slight or recent displacements, curing the laceration usually corrects the displacement by removing the cause; and sometimes even decided displacements may be cured by sewing up the lacerated cervix, for it may induce involution and give tone and strength to the ligaments, and restore them to a normal state. But it is safer to sew up the laceration early, for many cases when displacement is once established, will always need artificial support to keep the uterus in place.

By far, the most serious and troublesome complication of a lacerated cervix, is inflammation of the pelvic, cellular, and peritoneal tissue. A careful use of antiseptics in most cases will prevent this complication. When it does exist with a lacerated cervix, time must be allowed for it to become subacute. So variable is this trouble that no general statement would give a correct idea of all cases.

In comparatively recent cases, complete rest, external counter-irritants, and hot-water vaginal injections are about all that it is safe to do. After several weeks or several months, according to the character of the case, it may become subacute, and when so, by pressure and traction and counter-irritants, most cases can be got in good condition for an operation on the cervix in from two to six weeks. Even where there is much tenderness on pressure, and induration and adhesions firmly fixing the uterus in the pelvis, this may be done. In such cases, the general hyperæsthetic state of the pelvic tissue cannot always be removed by this preparatory treatment; but when you succeed in getting the uterus freely movable, it is safe to operate if anti-septic precautions are taken. My last case, done only ten days ago, was of this nature, and made a good recovery without either fever or pain. Often a laceration that has more or less healed up, will give no trouble until the uterus, after another labor, is left subinvolved, or is enlarged and congested by inflammation in or near it, when it begins to evert and erode, and soon presents a very bad appearance. It is true that *if you cure the inflammation and remove the swelling before the mucous membrane is too extensively affected, the patient will be relieved, but the same trouble is liable to recur.*

It is in this way that I account for some of the cases which give a reliable history of being torn during one labor, yet having no serious trouble until a second or third or even fourth child is born. After the first labor, it heals sufficiently to prevent trouble at that time, but after the second or third labor, on account of a want of cleanliness, feeble general health, or too early getting up, the old laceration is complicated by subinvolution or inflammation, and now compels the patient to seek relief.

Laceration of the perineum is a very common, and when it is sufficiently torn to affect the integrity of the floor of the pelvis, it is a serious complication of a lacerated cervix, for it very soon indirectly causes a displacement of the uterus. To prevent this troublesome and, in some cases, incurable result, it is best to sew up both the lacerated cervix and the lacerated perineum as soon as it is practicable. This should be done, if not before, at any rate, soon after the patient gets on her feet after labor.

As the same conditions that result in a vesico- or recto-vaginal fistula are liable to cause a laceration of the cervix, the latter is usually found in cases of fistulae, and should be treated after the fistula is cured.

I have seen malignant disease on the lacerated edges of a torn cervix, but I have also seen so many other cases of lacerated cervix of long standing in which no cancer had developed, that I have not been able to fully accept the general opinion that it causes cancer.

Old cases of laceration of the cervix uteri that have been treated with escharotics are not uncommon, and they are often troublesome from old scars and adhesions in and about the cervix.

Too long or too frequent use of irritant astringents, such as Churchill's solution of iodine, will also contract the tissues to such an extent as to be a real complication. And it is partly this which has given some of our gynecologists an idea that the worst pathological conditions are caused by "cicatricial plugs."

One of the last cases that I operated upon was a good illustration of this. I saw the case in consultation. The induration was slight, but, as the erosion was quite extensive, I advised preparatory treatment. In three weeks' time, when I went to operate, the doctor had, by applying Churchill's solution of iodine, once in two days, reduced the erosion, but also had caused troublesome cicatricial contraction.

Too prolonged or severe preparatory treatment does harm rather than good. Application may be made so as to cause a cicatricial contraction, and large tampons, when kept in constantly for a length of time, tend to obliterate the line of junction of the cervix with the vagina, and to separate the superficial and deeper tissues so that it is much more trouble to pare the edges and bring them evenly together.

To what extent must a cervix be torn to require an operation for closing the rent? It would seem that I have already made this plain, but so much has lately been said about this, that I wish to be clearly understood. After giving Nature a fair chance to do what she will after labor, and after removing, as I have indicated, as far as practicable, any existing disease or complication, if a laceration still exists, with gaping, everted, or eroded edges, or any obstinate abnormal condition, such as cystic degeneration, etc., rather than treat it with the actual cautery, caustics, or very strong astringents, to force healing by granulations, I would pare the edges, remove any superfluous or abnormal tissue, and bring the parts together with silver sutures.

The actual cautery destroys more tissue than is usually necessary to do in paring the edges, and it makes an open wound, which must heal by granulation and leave a scar. The same thing may be said about the use of caustics; besides, as it takes many applications to destroy the tissue, it is even worse than the actual cautery, for it not only makes an open wound, but adds irritation by repeated applications. Powerful irritants in time produce a cicatrix much the same as though escharotics had been used.

Some of the men who believe that cicatricial tissue causes most of the bad effects of a lacerated cervix uteri advocate a plan of treatment which really makes a cicatrix, and one, too, that in many cases, after a few weeks or months, relapses or causes an irritable ulcer. If hysterio-trachelorrhaphy was a dangerous operation, this would not be so strange. It seems to be due to one of two causes. Either the knife has been much abused in uterine surgery (what agent of power in medicine has not been?), or to the fact that many influential gynecologists have never learned to use the knife. It must not be forgotten that, less than a generation ago, the doctor who practised gynecology was pre-eminently a physician, and not a surgeon.

Hysterio-trachelorrhaphy is usually a very simple operation, and when precautions are taken against sepsis (as should be done even in the most trivial operations), and care is taken not to operate during peri-uterine inflammation, there is, perhaps, no operation in surgery which accomplishes so much good with so little danger to the life or even the comfort of the patient.

It consists in freshening the edges of the laceration, and in bringing them together with sutures. If it is double, in paring the edges of both lacerations, leaving a space in the centre for the cervical canal, and sewing up both sides. When there is superfluous tissue that is abnormal, it is well to remove it when paring the edges. Sometimes when the superficial wound is small, after we cut through the mucous membrane at the angle of the wound, we will find that the laceration extends much deeper, even as high as the internal os. Such cases usually are old ones that have once been supposed to have been cured by applications. When the cervix is long, the mucous membrane abnormal, and the uterus retroverted, it is best to amputate the flaps, *leaving a cervix of normal length*, and sew up the laceration above this point; at the same time cover the cut surfaces

with mucous membrane in bringing the edges together, and leave an opening for the external os. In some of my early operations, I left the cervix long, and it remained so, and afterward necessitated the use of a pessary to prevent retroversion.

In those cases where the uterus has undergone involution more or less completely, the cervix being large, this enlargement may be due to hyperplasia of the connective tissue, and change in the mucous membrane, and when the edges of the wound are pared, unless care is used, the sutures will not reach the deep muscular layer, and only bring together the superficial tissue. Afterward, when the induration disappears, we may have a crooked cervical canal; that is, the opening in the deep tissues will not correspond with the opening in the mucous membrane. When this does happen, fistulous openings along the line of the sutures are apt to form. Hemorrhage is often somewhat troublesome, but rarely sufficient to do the least harm, and when so, well-placed sutures readily control it. As the cases that bleed most freely are usually those where the cervix is flattened out, and the tissues quite soft, I have never seen a tourniquet applied that did any good.

In those cases where a part of the cervix is amputated, and in those where the condition or the superabundance of the mucous membrane warrants one in removing it all the way around the canal, there is some risk that the opening left for the external os may close up, and the secretions from the body of the uterus may force an opening somewhere else. To obviate this, it is well to insert a tent of linen or cotton, and to see the case several months after the operation, and, if necessary, enlarge the opening by dilatation, in case it has become too small. After operating, I have carbolized vaginal injections given twice a day. I leave sutures in one week, and keep the patient in bed for several days after this.

It is important, before beginning to operate, to first make an accurate diagnosis as to the extent of the laceration, the side that is torn, or, if double, how much each is torn, and the extent of diseased tissue to be cut away, etc. When operating, I cut out the angle of laceration, not to get out a cicatricial plug, but to enable me to draw the edges evenly together, and to reach the firm, muscular tissues at this point. I may take out a small triangular piece of muscular tissue, but because it is hard and gristly, and of a white yellowish-gray color, is no evidence that it is

other than the firmly-contracted muscular tissue. The upper layer may be cicatricial, and the connective tissue may be somewhat hardened, but is no more a cicatricial plug than any other part of the same tissue near or involved in the tear.

When, with two tenacula, you can readily bring the flaps together (I do not mean when you can slide the mucous membrane up over the flaps, and bring the edges together), then they are ready for the sutures. From two to four well-placed silver sutures made to include the mucous membrane and thickened connective and other superficial tissues, and the *deep, hard, and gristly muscular fibre* on each side, are, as a rule, amply sufficient to secure close apposition of the sides.

When the tissues are firm, I prefer a Sims' uterotome to cut out the diseased tissue and pare the edges; when quite soft, a pair of curved scissors are better.

I prefer to use in this operation a sharp beveled-pointed needle, slightly curved near the point, and not less than three-quarters of an inch long.

The operation, although not dangerous or formidable, so far as the patient is concerned, is very troublesome and tedious to the operator. Even experts, in handling the necessary instruments, will take from twenty minutes to an hour or more, according to the case, to do the operation.

40 WEST 40TH STREET,
Nov. 2d, 1881.

THE ETIOLOGY OF LACERATION OF THE CERVIX UTERI.

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A CERTAIN regularity in the occurrence of laceration of the cervix uteri removes it beyond the operation of the law of chances, and groups it among those events which are the outcome of fixed conditions. Looking upon it in this light we are afforded some hope that we may be able to anticipate it, and hence, in a measure to guard against it. On the other hand, if the lesion is regarded as the result of hasty or ignorant midwifery, as many excellent gynecologists teach, we are powerless to anticipate or understand it.

The lower uterine segment in parturition is the point of greatest expansion and almost as a natural result the usual seat of rupture and laceration. The upper and lower uterine segments are in a state of organic antithesis. The upper at the beginning of labor is at its maximum of expansion, and in the process of contraction becomes thicker in its walls. The order of events in the lower segment, including the cervix, is reversed. In the progress of labor the walls expand, and thus become thinner, and this proceeds in an inverse ratio, until such a degree of expansion of the uterine walls exists that the fetal parts are able to pass; at that moment the walls of the organ have attained their greatest degree of tenuity. Such a condition must be looked upon as a factor of weakness. Frommel shows that the os internum is the dangerous point in uterine rupture. At this point also occurs the maximum degrees of attenuation and expansion of the uterine walls. The next point is at the os externum. This part has an additional source of weakness peculiarly its own, namely, a termination in a free margin, an unsupported edge.¹

There is a community of danger to all the soft parts involved in the maternal outlet; rupture of the vagina and of the peri-

¹ Richard Frommel: Zur Aetiologie und Therapie der Uterusruptur. Zeitschr. f. Geburt. u. Gynäk., Bd. v., S. 400.

neum are quite often associated, and at the same time the vaginal portion of the cervix is added to the list of injuries.¹ A certain relationship exists between rupture of the vaginal portion and of the supravaginal part of the cervix uteri. Dr. Bradford in eighteen cases found the laceration on the left side in fifty per cent, and longitudinal in sixty per cent. The direction is the same in the majority of cases of rupture of the vaginal portion, as well as the preponderance upon the left side.² Without any consideration of the degree of the injury, it is probable that rupture of the tissues of the cervix occurs at every labor, especially in primiparæ. This may be so slight that no trace is left after repair; but radical tissue changes are the rule after labor. The shape and size of the external os is permanently changed. This change is mainly in its transverse diameter, and with any other theory than that of rupture of its connective tissue component, it would be singular that the direction of this quasi-normal change coincides with that of pathological rupture. In the same way rupture of the superficial layers at the frenum occurs at every labor, but not of sufficient extent to constitute a surgical injury.

Another evidence of regularity in the action of the forces that contribute to injury of the vaginal cervix is the excess of rupture upon the left side. This excess of the left over the right side is twenty-six per cent.³

It would seem to exist with greater force than a mere coincidence that the frequency of the first position of the vertex is about eighty per cent,⁴ while that of laceration upon the left side is forty per cent.⁵ While this proves nothing, yet it shows the probability of the left position of the vertex acting as a cause. Another condition which very probably exists as a cause of the excess in injury to the left side of the cervix is the preponderance of voluntary muscular effort upon the right side. This excess in power of the muscles engaged in voluntary expulsive

¹ Kaltenbach, *Zeitschr. f. Geburt u. Gynäk.*, Bd. ii., S. 275.

² Dr. Thomas Bradford: *Cases of Laceration of the Uterus, with remarks.* *Obstet. Trans.*, London, viii., 211.

Tauffer: *Bedeutung der bei der Geburt entstehenden Risse des Cervix Uteri.* *Pesther Med.-Chir. Presse*, August, 1879; *Centralblatt f. Gynäk.*, 1880, S. 110.

³ Emmet: *Prin. and Prac. of Gynecol.*, p. 448.

⁴ Baudelocque, *l'Art des Accouchements*, ii., p. 305. La Chapelle, *Prac. des Accouch.*, ii., 508.

⁵ Emmet, *loc. cit.*, p. 448.

effort is very great. The uterus and its contents being acted upon by two forces in the same direction, one stronger than the other, its contents would be deflected in the direction of the weaker force. One of the resultants of this lack of coequality in expulsive force of the voluntary muscles is the rotation of the head—a cause which I have never seen referred to by obstetrical writers. While the first position of the vertex would explain the possibility of cervical rupture to the left at an early stage of the labor, the latter cause would operate at a later stage, when the vertex, yet unfreed from the cervix, would impinge upon the left pubic ramus.

Another fact which bears upon the question of fixed factors, is that in the stage of dilatation of the cervix, the anterior and posterior segments of its circumference dilate in different degrees, and the usual seat of laceration coincides with the junction of these segments.¹

If it please the reader to reject the above as an explanation of the usual situation of this injury, at any rate the fact that a laceration, when sufficiently grave as to constitute a surgical injury, is in a great majority of cases situated laterally, places the lesion beyond the operation of chance or accidental causes, and invokes the aid of uniform forces in order to explain it.

Another circumstance, which shows that the accidental complications and delays that are liable to exist among primiparæ have but little influence, lies in the fact that seventy-six per cent of lacerations presented a mean of 3.21 pregnancies previous to the injury.²

It seems needless to add further to the evidence that in laceration of the vaginal portion of the cervix we are dealing with a natural phenomenon, for the explanation of which we must seek for rational, not accidental causes. From what follows, the reader will observe that many causes are traced to their sequence in laceration. Parturition is not a process to be viewed simply by itself—a mechanical act, but it is a culmination made possible by a series of vital events, subject to many deviations from the normal. The causes of this injury must be sought among these deviations both in their mechanical and vital relations.

¹ Birnbaum: Die Veränderungen des Scheidentheiles in den letzten Monaten der Schwangerschaft. *Archiv f. Gynäk.*, iii., S. 414.

² Emmet, *loc. cit.*, pp. 451, 456. Believing that upon this subject the figures of but one observer can be safely compared together, I restrict myself to those of Dr. Emmet.

(A.) Many of the changes which result in the *pathological conditions* of the vaginal parts are conducive to laceration of the cervix. A large share of the cervical ruptures occur in advanced multiparae from progressive degeneration of the tissues due to repeated labors and pregnancies, closely allied to the fatty degenerations of normal involution of the uterus. The degenerations accompanying mollities ossium which has been recognized as a cause of uterine rupture may also exist with similar effect in the cervix.¹ These degenerations affect the machinery of uterine contraction, namely its muscular structure, so that it literally breaks down by its own effort.² What has been shown to be a cause of uterine rupture is known to exist with even greater force in the vaginal portion—hyperplasia of its walls.³ I am inclined to place great stress upon this condition as a frequent cause of laceration. The connective tissue element being developed in excess of the muscular, the loss of balance implies an impaired power of muscular contractility. The hyperplasia, being a degeneration in excess of a normal element, defeats the physiological motive of the connective tissue fibres—the power to bind together and resist strain during muscular contraction.⁴ There is no doubt that in this manner hyperplastic tissue acts as a cause of rupture of the uterine body, but in the cervix it plays a still more important part in the etiology of laceration. One of the most important factors of safety against rupture of this part during parturition is the ability of the cervix to dilate by virtue of its inherent qualities. The opportunities are not rare to watch the tardy and imperfect manner in which a hyperplastic cervix performs its part in the first stage of labor. It has lost its power of dilatation through its excess of hyperplastic tissue, and when its limit of dilatability is reached, further expansion is gained at the expense of its continuity. It is probable that in this way laceration may result from full-term labors which have followed miscarriages or abortions, which is frequently observed.⁵

¹ Dr. Hall Davis, Trans. Obstet. Soc., London, xi., p. 207; also Snow Beck, op. cit., x., p. 100.

² Carl Ruge: Ueber die Contractionen des Uterus in anatomischer und klinischer Beziehung. Zeitschr. f. Geburt. u. Gynäk., Bd. v., p. 149.

³ C. Braun: Lehrb. d. Geburtsh. p. 385. Klob: Ut. Path., p. 247.

⁴ Dr. J. Henry Bennet: Inflammation and Induration of Cervix Uteri the Cause of Laceration. Obstet. Sec. International Med. Congress, London, 1881, AMERICAN JOURNAL OF OBSTETRICS, xiv., p. 939.

⁵ Emmet, loc. cit., p. 451.

A further source of weakness found associated with the hyperplastic condition of the cervix, is the enlarged cysts and ruptured follicles which may exist in the vaginal portion.¹ These form cavities at the direct expense of the inner connective tissue layer that is regarded as essential to the strength and solidity of the uterine superstructure by many writers. While, in the unimpregnated condition, the submucous connective stroma may contribute to the firmness of the cervix, there is no doubt that any break in its continuity would contribute seriously to the liability of laceration during labor. Another condition very similar, but not necessarily associated with uterine hyperplasia, is the cystic degeneration of greater or less size of the so-called ovula Nabothi, which are developed at the expense of the submucous stratum;² and, when existing in any size, leave gaps in the framework of connective tissue. These are regarded as one of the causes of flexion, when situated at the inner os, and must, when situated in the vaginal portion, prove an equal source of weakness. The connective tissue layer may be damaged in its power to resist lateral rupture, by softening due to long-standing catarrh of the mucous membrane, and by enlargement of the uterine glands, which attends the same condition.³

The progress of the labor itself may be attended by conditions which are due to it, and naturally destroy the elasticity of the cervical tissues. In case of early escape of the amniotic fluid, before the completion of dilatation, an edema of the vaginal portion, particularly in the anterior lip, presents itself, due to pressure of the lower uterine segment between the head and the pelvic wall, whereby a venous stasis is produced,⁴ which is termed edema of the cervix. This stasis may be of such duration and extent that sloughing of the anterior portion of the cervix may ensue, as stated by Lott. This condition may be a direct cause of laceration, by impairing the power of the connective and muscular tissue to resist rupture; or, by offering a serious obstacle to the dilatation of the cervix.

A like condition, due to a very different cause, is the edema of the cervix caused by obstructed heart-action.⁵ Cases are upon record of annular laceration of the cervix explained upon this

¹ Klob: *Ut. Pathol.*, p. 440.

² Hueter: *Flexionen des Uterus*, p. 38

³ Rokitansky, *Wiener allgemeine Med. Zeitung*, No. 17, 1859 (Hueter).

⁴ Lott: *Zur Anatomie u. Physiologie des Cervix Uteri*, p. 96.

⁵ Solowieff, *Centralblatt f. Gynäk.*, No. 13, p. 313, 1881.

theory; but there is no doubt that the free margin of the vaginal portion would suffer to the same extent. This cause acts with great force during the pregnant condition. In the unimpregnated, the livid and softened cervix observed in cases of heart-disease is a fair index of what takes place during gestation.

(B). Deviations from the normal in the changes of the cervix antecedent to the labor, which may result in laceration, are very important. The essential change of the cervix during labor is the dilatation of its canal to that degree that the uterine contents is enabled to pass. Here the cervical canal plays the rôle of an exit passage to the uterus. This is rendered possible by a series of vital events. The most powerful argument in favor of the play of vital forces in the dilatability of the cervical canal is the acute softening which is normal to the pregnant condition. It is impossible to conceive of a mechanical factor in this process. The onset of pregnancy is the signal for a series of tissue changes in the cervix. The layer of ciliated epithelium is substituted for that of squamous epithelium¹ in the uterus. The circulation of the part is revolutionized; the vaginal pulse of pregnancy evinces the increased activity of nutritive supply; the increased mucous secretion and the lividity of the surface show the venous stasis. Formative changes accompany the nutritive; the vaginal portion becomes relatively broader and shorter, and the os externum patulous from the swelling and seeming maceration of the mucous membrane of the cervical canal.² Physiological softening results from these manifold activities as common factors. How powerful these factors are, may be seen in the softening and resulting dilatability that attends some cases of vaginal atresia. This begins to be marked about the seventh month, and well deserves the name applied to it: "sudden," as some marked cases on record prove.³ From what I have seen of it, this seems to be due to an enhanced activity of these factors, bordering closely upon those which exist in the ramollissement of chronic inflammation. This may be seen in full operation in catarrhal inflammation of the vagina and cervix, where changes in color, texture and follicular enlargement⁴ present

¹ Virchow: Cellular Pathol., p. 100.

² A. Martin: Das Verhalten der Cervix Uteri während der letzten Schwangerschaft-Monate. Zeitschr. f. Geburtshülfe u. Gynäk., ii., p. 316.

³ Taylor, Trans. Am. Gynec. Soc., iv., p. 410.

⁴ Rokitansky: Man. Pathol. Anat., ii., p. 268.

themselves as the morbid analogue of normal gestation changes. This may go still further, and present the curious spectacle of a mingled action of healthful and diseased forces in the normal erosion of pregnancy.¹

Gestation softening, at a period more nearly approaching labor, is termed acute, to distinguish it from the subacute,² which marks the earlier stages of pregnancy. The first is believed to be due to compression of the circular vein,³ and the latter to the physiological hyperemia already spoken of. In brief, this physiological activity has a profound effect upon the tissues, namely, softening, retraction of the neck, patulousness of the os, follicular enlargement and activity, desquamation (erosion), color and texture changes, and the development of the so-called Müller's ring, which is due to the growth and activity of the parts.⁴ The chief of all these, and the one toward which all the others are subsidiary, is gestation softening.

This gradual and cumulative softening of the cervix constitutes the factor of safety in the enormous dilatation required of the cervix in the expulsion of the child. If, from any cause, the balance in the forces which tend to this end are disturbed, or conditions necessary to its completion are absent, this essential softening may be retarded or arrested. In such an event, the mechanical forces engaged in the expulsion of the child are capable of overcoming whatever of resistance the imperfectly prepared cervix may oppose, but do so only at the expense of a very probable rupture of its tissues. In some statistics published by Hüter, he observes that in eighteen per cent of labor cases, the external orifice was resistant or non-dilatable, and in all of which a remarkably slight degree of softening was noticed.⁵ Further, abortions from the fourth month upward are extremely liable to be attended by lacerations. My own experience bears me out in saying that the liability to laceration during abortion is equal to twenty-five per cent. This shows that it is not the extent of the dilatation required that is the source of the danger, but the absence of preparation of the part to be dilated.

¹ Cazeaux: Theoret. and Prac. Treat. on Midw., p. 123.

² Müller: Untersuchungen über die Verkürzung der Vaginal-Portion in den letzten Monaten der Gravidität. Beiträge z. Gynäk., v., 191, 1869.

³ Lott, loc. cit., p. 64.

⁴ Bandl: Ueber das Verhalten des Uterus u. Cervix in d Schwangerschaft u. während d. Geburt. Stuttgart, 1876. Lott, loc. cit.

⁵ Monatschrift f. Geb., xiv., p. 46 (Lott.)

Many circumstances may interrupt or modify the course of this softening. The most active local conditions that would tend to this end are those which, in a greater or lesser degree, alter the circulation of the part. Hyperplastic or cicatricial tissue, while it is itself powerfully influenced by the pregnant state, may yet interpose sufficiently to the physiological hyperemia as to seriously retard the preparation of the part. If, in this defective softening of the cervix, we have a rapid, energetic labor, injury to the cervix is almost sure to result. We all know the very characteristic touch offered, during the first stage of labor, by this state of the vaginal portion; and the slow, resistant dilatation which, in some instances, allows the imperfectly dilated os to be forced down nearly to the vulva before the advancing head. What we need in such a case is delay in the first stage; and a resort to the well-known means of mitigating the activity of uterine contractions in case they are too energetic.

In the absence of any local condition, I know of no causes within my own experience so quick to interfere with gestation softening, especially in its so-called acute form, as diseases which affect the value of general nutrition. It is very probable that in this way the imperfect circulation, due to cardiac insufficiency, partly tends to promote uterine laceration. The chronic starvation, or one-sided nutrition, seen in hysterical or neurasthenic diseases, is active in the same direction. The impaired nutrition of chronic uterine disease, associated as it is apt to be with uterine hyperplasia, is almost sure to interfere with this process. Another general condition which we find united with cervical laceration is that which belongs to the class of women who, from adolescence, shows feeble development and defective assimilative power. Laceration in these cases is usually connected with first labors. In the same way, and for the same reason, namely, because the nutritive value of the part is affected, the dyscrasias act to retard the softening of the cervix.

(C.) The gestation changes in the uterus being physiological, deviations from the normal in the mechanism of labor itself may result in laceration of the cervix. Healthful parturition implies a balance between all the forces engaged, both active and potential. This balance must exist, not only in relation to the various events, both mechanical and vital, which constitute the complicated process called parturition, but also in the matter of time. Time has a double meaning here; first, in the order

in which these events follow one another ; and secondly, in the rapidity with which these events succeed each other even in their natural order.

After the cervix has passed through the normal evolution that attends gestation, the part is ready for the mechanical changes that are effected by the forces engaged in the first stage of labor. It is upon the cervix uteri that these forces are concentrated. It is evident that dilatation of the cervix must be accomplished before the expulsion of the child. This normal condition of things must be the result of due balance between the forces engaged in dilatation and those which accomplish expulsion. That these forces are not identical, I think a study of the mechanism of cervical dilatation will prove. It is further evident that these changes must occur to a certain—not fixed—extent gradually, and that expulsion be timely to dilatation. The case related by Cazeaux illustrates this. He had examined the cervix in a young woman pregnant for the first time, and found it dilated to the size of a quarter-dollar, and supposing that some time must pass before labor he left the woman, but had scarcely reached the bottom of the stairs when he was quickly recalled, and found the head just ready to clear the vulva. After the labor he discovered a complete left cervical laceration.¹ Such a result was inevitable. This case illustrates both the errors ; that of lack of balance between the forces of expulsion and dilatation, and a want of timely and gradually exhibited expulsive force. One term does not imply the other ; for a proper preparation of the exit passage of the uterus is not equivalent to a stage of actual dilatation, but rather to one of dilatability. In the event of this stage of dilatability existing, if its full limit of distention is suddenly called upon, the tissues may rend before they can dilate.

We must look upon dilatation of the cervical canal as a mechanical process. The canal of the cervix distends at the expense of the thickness of its walls. This is true of any material of which a tube can be composed, or in other words, of any elastic substance. In the cervical canal, thinning of its walls may be divided into two stages which merge rapidly into one another. First, thinning by elongation ; and secondly, by expansion. That, in the earlier stages of dilatation, the uterine cervix actually elongates, has been denied by some, but seems

¹ Loc. cit., p. 387.

established now by good authority (E. Martin, Breisky, Ritgen, Hohl, C. Braun).¹ The earlier stages of the elongation process begin toward the end of pregnancy. This stage of cervical elongation seems to be due to hyperemia of the cervical portion and passive infiltration of its tissues, and must be closely related to gestation softening. This I term apparent elongation. True elongation, that is, an actual increase in the distance between the outer and inner orifices of the uterus, belongs to the period of active labor. If we take the view of some observers, that the supposed shortening which has long been believed to attend the advance of the child's head, is *quoad formam* and not *quoad substantiam*,² it is not difficult to admit it; for, in the terms stated, it is simply an admission that the cavity of the body becomes continuous with the cavity of the neck. This cannot be taken as meaning in any sense an obliteration or shortening of the neck. That this shortening precedes labor from two to eight weeks, as Birnbaum insists, must be rejected as entirely unproven. To take the ground of Litzmann³ that dilatation of the cervical canal ensues only as the result of retraction of the cervix, is to hold to an absurdity. Retraction is not equivalent to thickening of the walls of the cervix, for just in proportion as it retracted would it counteract the thinning due to radial expansion. The matter deserves space here simply that I may record my protest against any such theory.

Elongation of the canal of the cervix is a constant phenomenon. In early abortion I think it must be quite generally observed that the canal shows a greatly increased length.⁴ The cavity of the cervix is the point at which the ovum, forced out of the uterine cavity with all its annexes, may find lodgment; the increased space in the cervical cavity being gained by elongation. This cavity may undergo indefinite radial expansion and elongation without the cavity of the body proper having sensibly increased in size. This may be observed in those rare cases of cervical pregnancy.⁵ These are supposed to be cases of arrested

¹ Lott, loc. cit., p. 89.

² Birnbaum: Die Veränderungen des Scheidentheiles in den letzten Monaten der Schwangerschaft. Arch. f. Gynäk., iii., p. 414.

³ Beiträge z. Physiologie d. Schwangerschaft, d. Geburt u. d. Wochenbettes. Archiv f. Gynäk., x., p. 411.

⁴ Lott, loc. cit., p. 90.

⁵ W. Schüle: Ueber Cervical-Schwangerschaft, Zeitschr. f. Geburtsh. u. Gynäk., ii., Heft 2.

abortion where the ovum has not been severed from its attachments and becomes arrested and nidated in the cavity of the neck. Here in these cases there is extreme thinning of the walls of the cavity due to radial expansion and elongation, just as I hope to show must be the case in normal parturition. In abortion we find thinning of the walls of the cervix due almost entirely to elongation, the dilatation of the cervix being oftentimes small in proportion to the longitudinal expansion. This disproportion is no doubt the cause of the liability of abortions and miscarriages to lacerate the vaginal portion. I have two cases among my notes of abortions at the fourth month followed by lacerations of the margin of the cervix.

The greatest force during the dilatation period is expended in the direction of elongation. This is made evident from the fact that more or less permanence attends the extension of the cervix after labor, while the radial expansion quickly disappears in comparison. In post-mortem examinations, Martin found the canal of the cervix greatly elongated and correspondingly thin four days after labor.¹ That involution took place more slowly in the longitudinal fibres than in the transverse can be explained on no other theory so well as that given above.

In a normal condition of the dilatation process, expansion of the walls in the direction of the length of the cervix is in proportion to radial expansion.² But, as we have seen in cases of abortion, when this harmony in proportion is lost, injury to the cervix is very liable to occur. This points absolutely to two alternative conclusions, namely, that more than one force is engaged in the dilatation of the canal of the neck; or, if the result of one force, a modification or derangement of it destroys normal proportion in the dilatation of the cervix.

A clinical fact already mentioned, that of sacculation of the ovum in abortion, explains the nature of that force, and also the method of its modification. The ovum is expelled by uterine contraction, with a minimum of force external to the organ. The contents of the uterus are expelled from the cavity of the body; gradually as it leaves the cavity of the body it is urged, *vis a tergo*, into that of the neck. In proportion as it enters into the latter, the cervix is elongated to receive it. The cervix is elongated by the same force that expelled the ovum. The pro-

¹ Die Neigungen und Beugungen der Gebärmutter, p. 48.

² Lott, loc. cit., p. 90.

cess is completed when the uterine cavity has emptied itself into the cervical cavity. The aborted product advances no further, simply from the fact that it has passed beyond the grasp of corporeal expulsive effort. Uterine contraction ceases, and the ovum finds lodgment in the elongated cavity of the cervix for days or weeks. Radial expansion has taken place only at the os internum, caused by the same force that has partly expelled the ovum and elongated the cervix. The os externum remains but slightly, if any, dilated after the dilating force has ceased. The os internum contracts, and it is not unusual to find the upper portions of the aborted product forcibly held in the contracted inner os. Cases are upon record in which the same condition has existed during labor at term, and the child partly become sacculated in the cervical cavity.¹

It is probable, therefore, that elongation and expansion are due to but one force, and that when proper proportion between radial expansion and elongation is destroyed, the expulsion force is modified by sudden and undue increase, or by its suspension, or impairment.

This force is uterine contraction. All other agencies are contributory. Certain value is to be assigned to voluntary expulsive effort; but few of us have not seen labors in which this accessory was either wanting or seemed to complicate rather than aid uterine expulsion. In the same way the amniotic pouch when intact, by its uniform pressure, by its conical shape, and the directness with which the force of uterine contractions is transmitted through the organ to the lower uterine segment, forms a useful aid in dilating the cervical canal. The application of this force is a simple one. Conceive of labor having commenced. The os internum, the cervical canal, and the external os are undilated; these parts are in a dilatable condition, having undergone normal gestation changes. Such being the state of affairs, the uterine contractions begin, and the contents of the organ begin to impinge upon the lower uterine segment.² This portion gradually yields, becomes thinner, dilated, and elongated. The next to become involved is the os internum, which, as it is gradually dilated,

¹ M. Hoffmeier, *Zeitschr. f. Geburtsh. u. Gynäk.*, iii., Heft 2.

² This I define, for my purposes in this paper, as that portion of the lower uterine cavity which comes in contact with the presenting part of the child, hence it is that portion of the cavity, exclusive of the os internum, which dilates to permit the advance of the presenting part, and obeys the same laws of dilatation as the cervix itself.

becomes merged into the lower segment; and when it reaches the size of the presenting part presents its walls excessively attenuated. For this reason we have here a very dangerous point in uterine rupture. The os internum having given way, the canal of the cervix becomes involved; as it dilates it elongates, which are coincident events. Gradually, as the walls attenuate they elongate to accommodate the present part. Step by step the process advances until the cervical canal is dilated to the size of the presenting part, and thus contains all that portion of the fetus which has passed the os internum. Lastly the external opening gives way before the same force, and by the time the presenting part is firmly impinged upon its inner margin it is usually prepared to let it pass. In case the os externum offers undue resistance, the elongation process still continues in the cervix, until its walls are dangerously attenuated, and sometimes ruptures in the form termed annular lacerations of the cervix. While the lower uterine segment, the os internum, the canal of the neck, and the external opening of the uterus have been dilating, elongating, and thinning, with the advance of the child, the latter in equal proportion has been leaving the uterine cavity; and the fundus and upper segment have been contracting and in an equal degree following it.

The extent to which thinning due mainly to elongation may be carried, is enormous. Beginning at the os internum, the wall of the cervix may become almost membranous and contrast so sharply with the thicker wall of the uterus above, that it may be recognized externally as a deep sulcus in the abdominal wall above the pubes, in which case it may be regarded as a signal for rupture of the lower segment.¹ In the illustration of a section of the frozen cadaver of a woman who expired in labor during the period of expulsion, after Braune,² the posterior border of the os internum corresponds in situation with the promontory of the sacrum, and the anterior is situated midway between the pubes and umbilicus. The os externum in front is near the lower margin of the pubic bone, and behind it reaches the coccyx. The cavity of the cervix thus elongated, contains the head, neck, right fore-arm, and hand, left shoulder,

¹ Kucher: How to prevent Rupture of the Parturient Uterus. AM. JOUR. OBSTET., xiv., p. 627.

² A. Martin: Atlas of Obstet. and Gynecol. Eng. ed. Plate xxvi., Fig. 1.

and arm of the fetus. There is no reason to suppose that this differs in any essential particular from the norm.

Nothing can be more delicate than the adjustment existing between force and tissue resistance in the parturition process, and probably there is no function of the human body more easily disturbed. Viewed in the practical, purely mechanical way in which I have put it, we may readily see in what way the uterus may establish a false channel for the exit of its contents through the attenuated, membranous walls of the cervix. And this it is sure to do, as is proven in many well-described cases,¹ if the external os continues resistant. Looking at it rationally, it is evident that it is a factor of safety for the woman that the sum of uterine tissue resistance is not equal to the forces which combine to effect the expulsion of the child.

It becomes easy, when we know the relations of parturient force to the tissues of the cervix, to understand how liable this portion of the uterus is to be damaged by the passage of the presenting part of the child. In this portion of the subject, we assume that the gestation changes of the cervix are normal. Exemption from damage depends upon two conditions: First, that the distention of the cervical canal and os externum be kept within limits of safety. Second, that the distending force be applied gradually so as to permit the tissues of the cervix to accommodate the distending force by degrees. In regard to the first, if the os externum is forced to exceed the limits of safe distention, it must rupture. Malpresentations are, therefore, a source of danger. Introduction of the hand in turning may distend the cervix a step beyond its power to resist. Fixation of the head may cause the os externum to be drawn forcibly over the presenting part and thus rupture, not only the cervix, but the vagina also.² Oblique position of the uterus may so advance³ the presenting part that the os externum fails to properly dilate, and finally ruptures from the continued distention laterally.

The second cause is the more frequent source of danger. In the first, the obstetrician may have been helpless; but here, he may be able to do much good. If there appears to be dispro-

¹ Baker: Annular Laceration of the Cervix Uteri. Lond. Obstet. Trans., ii., p. 329. Bandl: Ueber d. Ruptur d. Gebärmutter u. ihre Mechanik, p. 24.

² Litzmann: Archiv f. Gynäk., Bd. x., p. 411.

³ Dr. Mekertschiantz: Centralblatt f. Gynäk., 1881, p. 311.

portion between uterine contraction and dilatation of the cervix, the energy of uterine contraction may be assuaged and time given to the tardy opening to dilate. One source of danger ought, from very shame, to be avoided, and that is, urging the woman to exert all her expulsive power in order to hasten the expulsion of the child. When the head is ready to pass the vulva, a woman does this instinctively; but during the dilating stage, she has to be urged to her work; if left to herself she will not force down. Excess of amplitude in the pelvis may permit too rapid descent of the child, and rupture the cervix before it is fully dilated. A very small fetus may in the same way descend too rapidly. In this way, I fancy, miscarriage, in addition to anticipating due preparation of the cervix, may add a further element of danger. Adhesions of the fetal membranes to the circumference of the os internum,¹ by retarding the distention of the cervix until uterine expulsion suddenly overcomes the resistance may cause laceration. Unduly thick and resistant fetal membranes, by delaying the dilatation of the os² externum and suddenly giving way, followed by a quick descent of the presenting part, may produce the same result.

It is not rare to observe delay at the os externum caused by resistance to the dilating force: it is not rare also for an impatient attendant to give ergot to spur on uterine contractions already as urgent as the preparation of the external os will permit with safety. I am satisfied the result is more often laceration of the free margin of the cervix than not. This is, of course, bad practice, but the teachings of good authors are no better. The directions are not to give ergot until the cervix is dilated, or dilatable. The normal condition of the parturient cervix is rather dilatable than dilated, for the part is not dilated until occupied by the presenting part. As I have already stated, the dilatable cervix cannot be called upon suddenly to fulfil its function as an exit orifice for the uterine contents without exposing it to the danger of rupture. This is just the danger that the sudden uncontrollable uterine effort, oftentimes excited by the administration of ergot, exposes the cervix to. If one has due regard for the safety of the cervix, he will not give ergot under any circumstance for the purpose of expediting the delivery.

¹ Bidder: *Ein Beitrag. z. Mechanik d. 1. Geburtsperiod.*, St. Peterb. Med. Zeitschr., Hft. 7, 8, p. 1, 1868 (Lott). Hecker: *Klinik d. Geb.*, l., p. 119.

² Lott, loc. cit., p. 97.

(D.) The cervix being normal with respect to its tissues and gestation changes, while dilatation conforms to the physiological standard in its first stage; the cervix may be endangered by a defect in the action of the uterus.

Irregularity of uterine action may misdirect the advance of the presenting part, so as to suspend the dilatation of the os externum and cervix, the former remaining rigid and resistant. In Reil's theory of uterine polarity,¹ we have a reasonable explanation of the phenomena. If we concede that the uterine contractions have normal centres or poles of action, from which the contractions spread in a regular manner, we substantially admit the truth of Reil's theory. When the poles or foci of uterine contraction are distributed eccentrically, sometimes to one side, or in streaky contractions, meeting in contradictory directions, we have two results, one an inclination of the uterus toward the centre of contraction (uterine obliquity), and the other, an ineffectual or defeated expulsive effort, by reason of which the cervix and os externum remains thick, firm, and slowly dilatable. The round ligaments having the office to hold the uterus down to the superior strait,² attached to the superficial muscular layers as they are, may also become the foci of contraction, which will cause uterine obliquity.³ As a marked evidence of uterine polarity, Dr. Roger remarks that, when the fundus in labor fails to contract from injury, the cervix remains contracted, the uterine polarity being transferred from the fundus to the cervix.⁴ In such a case as this, however, we must remember that the mechanism of uterine contraction is impaired, and in the same measure the dilating power is lost. Many observers reject the theory of Reil, but, in the light of clinical facts, it matters little whether we reject his technology or not, as he simply offers an explanation of what we observe in hour-glass contractions and irregular pains. The hand over the external surface may detect irregular, lumpy, spasmodic contractions, which we know retard and embarrass the dilatation stage. The effect of uterine obliquity is well illustrated by a case of Chapman,⁵ in which the posterior cervical wall

¹ Obstet. Jour. Gt. Br. and Ire., vii., 610.

² Litzmann, Archiv f. Gynäk., x., p. 410.

³ Reil's theory, loc. cit.

⁴ Trans. Obstet. Soc. Lond.; AM. JOUR. OBSTET., xiv., p. 697.

⁵ Obstet. Jour. Gt. Br. and Ire., vii., p. 612.

was largely distended, while the external os was but partially dilated. In such a condition laceration was imminent.

Strong mental emotion, will, under certain conditions, disturb the rhythm of uterine contractions, and change the normal course of the labor. The contractions lessen in intensity and shift to various portions of the upper segment, and thus render the dilatation of the cervix slow and imperfect.

The hysterical state may also suspend the harmony of uterine action, and thus favor laceration. It is a clinical fact that the presence of a dead fetus will disturb the regularity of uterine contractions,¹ and result in slow and imperfect dilatation, and to the same extent endanger the cervix.

(*E*). Mechanical interference with the advance of the presenting part has been known to cause laceration of the cervix. My friend, Dr. Gregory Doyle, of Syracuse, associated with Dr. M. D. Benedict, some years ago delivered a woman in whom a large vesical calculus was the obstructing cause. The case terminated in a severe laceration of the cervix. Instrumental deliveries and other obstetrical operations involving force, and making still further demands upon the dilatability of the cervix than the presenting part, must be assigned an important place as factors of lacerations.

Another condition which must be classed among mechanical causes, is the delay of the head, often met with at the pubic arch or the perineum. The cervix, from long-continued distention and pressure, may give way. Indeed, I have met with cases in which it was impossible to explain the injury to the cervix in any other way. We ought to resort to the short forceps in case of undue delay at this point, even when we feel sure that time may enable the labor to complete itself, having in mind the injury the cervix may suffer from long-continued distention, fully occupied as it is by the presenting part. Lastly, there is no doubt in my mind that lacerations of the cervix may be progressive; that a slight laceration, the result of a prior labor, may be extended by a subsequent parturition. The condition of the tissues at the bottom of the laceration is favorable to this further extension. Of the same character is the recurrence of the laceration after union by an operation. My experience extends to but four cases, and in each one the laceration was renewed at the next labor. In one instance, the operation was

¹ Barnes, Trans. Obstet. Soc., Lond., AM. JOUR. OBSTET., xiv., p. 699.

repeated upon one side, while, in the prior case, the operation was bilateral.

From the variety and importance of the conditions which I have traced here as factors of laceration of the cervix uteri, it will be useful to recapitulate:

A. Pathological changes in the cervix may lead to lacerations during parturition from: (1) progressive degeneration of tissues due to repeated labors; (2) cervical inflammation and hyperplasia; (3) degeneration of ovula Nabothi, or cysts or follicles degenerated into cavities; (4) softening, due to chronic catarrh and inflammation; (5) presence of cicatricial tissue; (6) edema of vaginal portion occurring at the first stage; (7) edema due to heart-disease.

B. Deviations from the normal in conditions of the cervix antecedent to the labor due to general conditions, as follows arrested or impaired gestation, softening due to many causes.

C. Deviations from the normal in the mechanism of labor. (1) Want of balance between radial expansion of cervical canal and elongation; (2) untimely expulsion with reference to cervical expansion; (3) excessive amplitude of pelvic strait, or (4) a small fetus permits too sudden expulsion; (5) adherent membranes; (6) sudden rupture of membranes with rapid expulsion; (7) administration of ergot.

D. All the foregoing conditions being normal, the cervix may be endangered from defect in the action of the uterus. (1) irregularity in action of the uterus (uterine polarity); (2) disturbance in direction of descent of head from uterine obliquity; (3) harmony of uterine action disturbed by mental emotion; (4) hysterical state.

E. Mechanical causes: (1) Obstetrical operations; (2) vesical calculi; (3) long-continued distention by arrest of the head at the perineum.

NOTES OF ONE HUNDRED AND THIRTEEN CASES OF
OPERATION FOR LACERATION OF THE CERVIX.

BY

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I HAVE had one hundred and thirteen cases of operation for laceration of the cervix, and without a death. Of these, ninety-nine were bilateral lacerations; three were on the right side alone; eight were on the left; and three were markedly stellate, involving three sides or more. The reason why these operations show such preponderance of bilateral laceration is simply this: in my experience, when one side alone is torn, the sound side acts so like a splint that the lips of the fissure are not liable to spread apart and cause ectropion to a pathological degree. They, therefore, as a rule do not need an operation. Of these cases union wholly failed in two. In four, the union was partial; but in two of these, a suspicious looking cervical growth had been previously removed. It, however, was not malignant, for in each a subsequent operation proved perfectly successful.

The number of cases in which the forceps were used I have not noted; but I have generally found that when the tear was an unusually bad one, the perineum was also torn, and that the labors had been instrumental. In six of these cases, both perineum and cervix had to be operated on. In three of these, both lesions were operated on at one sitting. All were successful.

Of my one hundred and thirteen cases, thirty-five were performed in the amphitheatre or the private operating rooms of the hospital of the University of Pennsylvania—which is a general hospital. Of these, two had serious attacks of perimetritis and of parametritis, and two had slighter attacks; all due to hospitalism. They recovered, but in one the convalescence was delayed by the formation of two abscesses in the leg. In this case, the patient next to her broke out with erysipelas on

the day of the operation. In the other bad case, an explosion of erysipelas took place on her face and trunk. Strange as it may seem, the union in all these cases was perfect. I attribute this success to the fact that the stitches were not removed on the outbreak of the pelvic inflammation, but were allowed to remain a much longer time than usual.

As the carbolated spray obscures vision in such operations it was not resorted to in any of these cases, the only antiseptic means employed being a 2.5-per-cent solution of carbolic acid for the sponges, and vaginal injections of the same solution repeated twice a day until the stitches were removed. The same means were used in my seventy-eight private cases, and of these I had but two with any symptoms of inflammation. The attack was in each case mild and manageable, giving me no anxiety whatever.

Of all my cases, I had but one of secondary hemorrhage—my forty-first case. It was checked by a vaginal injection of a saturated solution of alum. This immunity I attribute to my rule of passing in the stitches very deeply. Hemorrhage during the operation has often been free and troublesome, but I have never ventured to check it by astringents. The plan which I have long adopted is to pass a wire under the bleeding vessels, and make traction on the ends, while the denudation is carried on. This wire is afterwards utilized as a suture.

Many of my cases of bilateral laceration, but not all, had become sterile after the receipt of the injury, but the exact number has not been accurately recorded in my notes. Of those whose track I could keep after the restoration of the cervix, four very shortly afterwards became pregnant. In three of these, the laceration was not reproduced; in one a tear occurred on the left side, but not of sufficient extent to warrant an operation.

In my opinion, the cervix should always be restored whenever ectropion of the mucosa takes place, and whenever the glands of Naboth become enlarged. Indeed, the visible presence of these glands around the os externum is a very good proof of cervical laceration. But it is not an infallible one, for I have met with them in virgins and in multiparæ with hemorrhagic tendencies from fungous vegetations. These glands often honeycomb the line of denudation, and I make it a rule, whenever it is feasible, to dissect them out. In one of my

patients, whose mind hovered over that ill-defined border-land between hysteria and insanity, the cervix was literally riddled with these glands. They lay so close together and were so much enlarged as to look like the seeds in a pomegranate. I could not dissect them all out, because too much tissue would have been removed, and yet the union of the parts was excellent. The operation cured her of an obstinate irritability of the bladder, but her brain was not much improved.

Another indication for the operation is a hereditary tendency to malignant disease. There is no question in my mind that a cancer of the cervix starts from the constantly-fretted and chafed, raw surface of a laceration. One would infer this from *a priori* reasoning; but it is further substantiated by the fact that this disease very rarely, indeed, attacks a virgin or a sterile woman. On the other hand, the more children a woman has given birth to, the greater her liability to cancer. Then again, the fissure of an old rent is very often found in a cervix attacked by malignant disease. Acting upon this belief, I have operated upon torn cervixes, without local or constitutional symptoms, for no other reason than that there was a history of cancer in the family.

A third indication for the repair of the cervix is the existence of stubborn and subacute peri-uterine inflammations. I make this statement with some degree of diffidence, for it is contrary to the teachings of our very best gynecologists, and, especially so, to those of Dr. Emmet, to whom we owe the largest measure of thanks for devising this ingenious and most valuable operation.

Every one of us has seen cases of bad cervical laceration complicated with tender and thickened broad-ligaments, or with more or less of fixation of the womb—cases which refuse to yield to treatment. Usually each menstrual period rekindles the dying embers of the inflammation, and these monthly exacerbations undo the good gained by the intermenstrual treatment. In these cases, there is plainly a relation of cause and effect between the lower lesion of the cervix and the upper pelvic lesions. The cervical wound produced in the first place the phlegmon of the broad-ligament, and the monthly over-engorgement of the womb, caused by the afflux of blood to the cervical sore, brings about the pathological turgescence of the vascular appendages of the womb. Hence the persistence of the ovaritis,

or of the peri-uterine inflammations. Cure now the chafed and angry cervical sore—the *fons et origo mali*—and you lessen the monthly afflux of blood, and, consequently, the monthly exacerbations of of the upper pelvic lesions. Acting upon this idea, I have, on several occasions and under such circumstances, performed the operation, and thus far I have every reason to congratulate myself for taking this responsible step.

For instance, fifty-six hours ago, I repaired a torn cervix under the following circumstances: The lady had been operated upon, six months ago, by one of our best gynecologists. On the next day furious pelvic inflammation set in, which kept her bed-fast for three months. Eighteen days elapsed before it was deemed safe to remove the sutures. During that time she was deemed ill enough to have a consulting physician—indeed, her life was despaired of. Not only did union not take place, but a great amount of gristly, cicatricial tissue had been produced by the failure. The lady was in wretched health, for the left broad ligament was thickened, the womb somewhat fixed, the vaginal roof sore to the touch, and every movement of the bowels accompanied with pain. For the last three months she had been under the best of care, but with no improvement. Feeling sure that nothing but the radical treatment would cure her, I operated, as I stated, fifty-six hours ago. I took good care to saturate her with opium and quinia, and to keep up the saturation. This afternoon her temperature is 98.1°, her pulse 76, and I have now but little fear of inflammation in her case.

Another occasional indication for the operation is the presence of dense cicatricial tissue in the angles of the fissure, always provided that various pelvic neuralgiæ and distant nerve-perturbations can be satisfactorily traced to the cervical injury. Sometimes this can be proved by the tenderness of the cicatrix, coitus, or the pressure of the sound on some point eliciting radiating pains. Oftener the relation must be inferred either from the monthly exacerbations, or from the exclusion of other causes. The diagnosis is not not always easy, and I am sure that I have here made mistakes—that is, I have removed wedges of cicatricial tissue without restoring by that means my patient to health. From my observations I am disposed, indeed, to believe that the baneful influence on the system of hard and gristly cicatricial tissue left after some cervical tears has been over-rated. I am willing to concede that sterility is sometimes owing to it, as it clearly was in one of my patients who became pregnant immediately after the operation. I am also ready to

grant that reflex pains and visceral disorders may come from it ; but I am inclined to look upon these results as exceptional, and that a tear of the cervix is too often made the scape-goat of headaches and nape-aches, of spine-aches and backaches, and of various other nervous explosions, which are due to nervous exhaustion or to nutritive changes in nerve-centres, rather than to traumatic injury of their extremities. In other words, the constitutional phenomena are dependent usually on ~~fine~~ central lesions, and not on the reflex influence of coarse peripheral injuries. My experience would lead me to say further that, while a woman is suckling her infant, and menstruation is thus kept away, she may not appreciate the evil effects of even a bad laceration ; but as soon as she gives up suckling, and the monthly congestions begin, very exacting local and constitutional symptoms soon set in.

Of the beneficial results of the operation of trachelorrhaphy, I must candidly admit that I am not now so sanguine as at first. Cases have disappointed me ; but then, on the other hand, I have, undoubtedly, operated on some cases unnecessarily. The broad rule may be laid down that, when marked ectropion exists, associated with enlarged Nabothian glands, with leucorrhœa and menorrhagia, the issue of the operation will be a happy one. In such cases, I have had capital results. The most costly present ever received by me from a patient came from a lady who had been an invalid for eleven years, but who was restored, by this operation, to health and to society. Dr. E. L. Duer aided me on the occasion, and will be able to corroborate my statement. When, however, I have operated on a tear without ectropion, or merely on account of cicatricial tissue in the angles of the fissure, I have met with some bitter disappointments. But I now know better when to operate ; and this fact I have learned, that nervous exhaustion and spinal irritation will evoke symptoms which others, as well as myself, have referred to slight cervical tears, but which are in no wise dependent on these lesions.

My mode of operating is, first to coaptate the parts by two tenacula, and to determine with the sound the proper site for the new os externum. At the very centre of this site, the two lips of the fissure are transfixed by a powerful needle armed with a stout silver wire about two feet long. The ends of this wire being twisted together, form a long loop, which puts the

womb under perfect control. By it, the womb is gently drawn down and put within operative reach. By hooking up with a tenaculum that portion of the wire running across the fissure, viz., its middle, the loop is doubled at the expense of its length, and by separating the two loops, the lips of the fissure are drawn apart. The denudation I now prefer to make with a knife, trying always to remove all the cicatricial tissue, and in one piece, if possible. After the denudation, the wire is again converted into a single loop, by releasing its middle portion and drawing it back. This brings the lips together with mathematical precision, and shows whether any further trimming is needed. I always shot my sutures, and very generally shot also the guiding or piloting suture. To facilitate the drawing down of the cervix and the removal of the stitches, I leave uncut the ends of this wire and those of the highest suture on either side. I try, of course, to operate at a time when the catamenia will not be reproduced, or be precipitated. But, in spite of this caution, I have often had the menstrual flow to occur a very few days after the operation; yet, in not a single instance has such a misadventure interfered with the prompt and perfect union of the parts. On several occasions I have, at the same operation, curetted the womb for those vegetations which are so likely to be found in the endometrium in cases of old cervical tears; but while this is a great saving of pain and of time to the woman, and has thus far not been followed by bad results, I deem it too unsafe a practice to be generally resorted to.

THE PRESENTATION OF THE HEAD AND FEET.

BY

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HAVING recently met with three cases of the complication which forms the title of this paper, I have been surprised to find that the subject is very largely ignored by obstetric authors. Accidents of rare occurrence are apt to receive scant attention in text-books, since definite rules for management cannot be given until a sufficient number of recorded cases has accumulated.

The presentation of the head and foot (or feet) is one which can very easily be characterized, depending, as it does, upon the essential fact that the fetus is more or less doubled upon itself. In transverse presentations, we may find at the os uteri one or both feet, one or both hands, and frequently the umbilical cord. None of these complications materially influence the usual procedure, namely version, though they may determine us to make podalic rather than cephalic version. But, when the head of the child is found at the superior strait, one or both feet cannot simultaneously present, unless the uterine contractions have, to a certain extent, doubled the child upon its long axis. This doubling being the essential point, it makes little difference if, at the same time, a hand or loop of the funis are added to the presentation, as is quite commonly the case.

An imperfect survey of obstetric literature brings out the following facts: First, as to its rarity. Collins, in 16,654 cases, did not meet with the presentation, and in the tables contained in the appendix to James' edition to Merriman, an aggregate of 33,947 cases presents a single instance (head with both feet). Gooch, Blundell, Dewees, Moreau, Velpeau, Osborn, Chapman, Churchill, Bedford, Murphy, Meigs, and others do not mention the occurrence at all. Some others

devote a few lines to the subject, and, in several instances, would have done better to have kept silence altogether. Meadows (Manual, p. 359), says: "The feet and head *are said* occasionally to constitute a presentation." Playfair (Midwif., p. 317), after brief mention and vague directions for procedure, adds: "There is generally sufficient room for the head to pass." There is no recorded case which justifies this statement. A tendency to parrot-like reiteration pervades the subject. Thus, in Clay's Handbook (p. 247), we find: "Head and Foot. May arise from unskilful turning. Secure the foot with the fillet, and press the head up." In Cock's Manual (p. 147), it reads: "Head and Foot. May occur in unskilful turning. Put a fillet on foot, and press up head." This is certainly a curious coincidence. In some other instances, it is difficult to determine whether the author was or was not speaking from his own experience. Hodge gives elaborate directions (*vide infra*), and then rehearses a case from Cazeaux. Schroeder simply echoes Nägele's remarks, without reporting a case. Simpson's lecture-notes allude to it. Denman makes only a brief general allusion to the presentation, and Burns is scarcely to be distinguished from him. These authors may have felt it to be unnecessary to write more particularly about so rare an occurrence, but actual experience would surely have led to a less slighting mention than is generally given.

The recorded cases are as follows: Cazeaux (Midwif., p. 850) mentions two cases, the first in his own practice. The head presented in the mento-posterior position with a foot, the conjugate diameter being also narrowed to three and one-eighth inches. He first endeavored to push up the foot; failing in this, to turn; this failing, the forceps were applied, and these also being inadequate, the child was delivered by craniotomy. This is precisely the order of procedure recommended by Hodge. Cazeaux notes more briefly a case which occurred to Dr. Lefleur, in which the woman *died undelivered*. The head presented by the face in this case also.

Nägele (Lehrbuch, p. 355) alludes to its rarity, and to its occurrence chiefly with dead, limp (*welken*), or premature children, and after unsuccessful efforts at turning when the head presents. He records a case in which he detected the head in the first position, with the right arm and left foot, shortly

after the escape of the liquor annii. He turned without difficulty, and delivered a living child weighing eight pounds. For similar cases, he refers to Mauriceau, Portal, Lamotte, Lachapelle, and Cazeaux. I am in doubt as to some of the reports. Smellie's case 348 is possibly one of this nature, though I should rather regard it as a simple transverse presentation. McClin-tock, however, makes it the occasion of a note upon this presentation, stating that he has seen a few cases himself, and referring to Lamotte and Roberton for others. Milne is also a little obscure. He says: "Head, Foot, and Hand. Here we must grasp the foot, and help up the head by counter-pressure, if necessary, letting the hand alone. In a case where the hand descended along with the head (reported by Dr. Gray, in the *Edinburgh Month. Jour.*, January, 1851), 'The hand was forced through the vagina and into the rectum.'" He adds that it is rare and that it is usually occasioned by a large pelvis, which also gives plenty of room to work in. Elliot's case 182 (Obst. Clinic) records a presentation of the head, foot, and funis; a still-born child being delivered by turning. Leishman records and figures a case in which head, foot, hand, and funis presented; in which a still-born child was delivered by turning, with great difficulty. Ramsbotham says (p. 345): "I have known some few instances in which the head, a foot, and a hand were all presenting at the same time." He directs the foot and hand to be pushed up, if practicable, and if not, to turn. Dr. Starling Loving, of Columbus, communicates to me a case observed by himself, in 1858, in which the head and both feet presented with the funis. He discovered the presentation immediately after the rupture of the membranes, and delivered a living child by turning, which was easy of accomplishment. The fetus was probably a month premature.

My own cases are as follows, and illustrate also a proverb of wide application, namely, that "it never rains but it pours."

CASE I.—April 14th, 1881. Called in consultation by Dr. A. M. Bleile to a multipara, in the following condition: Placenta previa, central. She had lost much blood during the last month and at the onset of labor, and the pulse was now fast and feeble. I at once detached the placenta from the cervical zone, as recommended by Barnes, after which there was no further hemorrhage during the labor. No presentation could at first be detected, but with some difficulty I found the head and a knee present-

ing above the brim, the child being doubled up, as traceable by external palpation. Version was accomplished after prolonged effort, and a still-born child at length delivered. Some hemorrhage followed the delivery before the uterus could be induced to contract. The woman was considerably exsanguined, and made a slow but perfect recovery.

CASE II.—Mrs. B., æt. 34; third pregnancy, August 26th, 1881. Midwife in attendance; placenta previa, central, which had been largely detached by the midwife, and there was no present hemorrhage. The woman had lost considerable blood for three weeks, and her general appearance suggested the propriety of prompt delivery. The presentation was a third facial, or rather brow, with a foot alongside, and in front of the head. External palpation showed that the child was very large. The abdominal and uterine walls were thin, and the fetal heart being inaudible, made it pretty certain that the extensive placental detachment had resulted in fetal death. Without much trouble, I succeeded in pushing the foot up, and getting the head alone to present, but no manipulation would convert it into a vertex presentation. Deeming it unnecessary to waste time further upon a dead child, and considering the precarious condition of the mother, I perforated the head and delivered with ease. The child weighed *fifteen pounds*. The mother made a prompt recovery.

CASE III.—Mrs. M., æt. 25; second pregnancy. Oct. 12th, 1881. Labor began at 4 P.M., a midwife in attendance. A child was born at 7 P.M., and the midwife finding another child presenting by the head, two feet, one hand, and the funis, sent for me. Due efforts were made to replace the offending members, and also to turn; but traction upon the feet, conjoined with upward pressure upon the head and external manipulation by an assistant, were all used in vain. I, therefore, perforated and delivered without further trouble. The twins were each girls, weighing seven pounds each.

The cases fully recorded in which the result of the labor is stated are, therefore, very few, nor would the number be greatly augmented by a fuller search, which I have been unable to make. These are Cazeaux, two; Leishman, Elliot, and Nägele, each one, which, with the four cases here first recorded, make nine in all—an insufficient number from which to draw very certain conclusions. The tendency of complicated labors to be very complicated, which is incidentally shown in this summary, is an additional reason for being slow in laying down rules for procedure. Much must be left to the judgment of the practitioner. But I think we are warranted in attaching less importance to turning than has heretofore been given. The whole question hinges upon whether the child is

alive or dead. A live child is much less apt than a dead one to be doubled up *in utero*. There is a *prima facie* case against the child if it remains in this position for any length of time. A live child is easily turned; a dead child has lost its resiliency, and is turned with great difficulty, especially if doubled up. In two of the foregoing cases where the children were born living, it is expressly stated that version was accomplished readily, and just after the escape of the waters.

To turn a dead child, as in Leishman's and my first case, is to do a very useless thing, and to subject the mother to unnecessary inconvenience and risk. I would, therefore, amend the procedure of Cazeaux by recommending: first, to replace the prolapsed members, if possible; second, if not, to make moderate efforts to turn; third, if this cannot be accomplished readily, to perforate and deliver. The application of the forceps after failure to turn would seem to be clearly needless.

THE HYGIENIC AND DIETETIC REGIMEN OF UTERINE THERAPEUTICS.

BY
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OF equal importance with the active, local treatment of uterine complaints are the little details of every-day life, which are often lost sight of altogether, or else deemed of little or no importance. They are so simple as to be forgotten. It is safe to say that no active interference in inflammations and dislocations will, unaided by strict attention to hygienic detail, accomplish a cure. It is by enjoining a faithful observance of these things that the physician will achieve the greatest reputation. Modern therapy has achieved no greater distinction than a recognition of a well ordained home life.

It is far-sighted in differentiating in those cases which need active interference as opposed to others which merely call for rest, diet, and exercise. By calling to its assistance every

factor essential to health, gynecology wisely ordains that the laws of nature are simple in operation, and when perverted into unhealthy channels, that they must be persuaded back to legitimate action, and never coerced. Youthful ambition is often a *facile princeps* of grievous error. The wide grasp of knowledge that is born of experience, that is conservative rather than special, that sees beyond the mere local complaint a long series of visceral disturbances, will call into action every advance of general medicine, and will not despise any means to a desired result, be they never so simple.

Under proper instruction, the woman who suffers with a uterine disorder can accomplish much for herself; but she should be told intelligently just why certain positions, exercises, and foods are necessary, that she may not undervalue their employment. She should also be profoundly impressed with the conviction that, unless she is willing to observe such instructions conscientiously, and for a longer or shorter period of time, she cannot hope to recover her health.

The daily employment of certain movements is one of the most useful aids in uterine therapy. Most women suffering with mal-placed uteri are unable to take proper exercise. Standing fatigues them, walking is painful, and they groan incessantly with backache. The life of indolence which, *volens nolens*, they must adopt, induces constipation, dyspepsia, and nervousness. The muscles become flaccid and weak, and be their diet never so well chosen, they lose strength, even though they may gain in flesh.

These well-regulated exercises, beginning moderately and increasing gradually to their maximum, will counteract all the evils that arise from a lack of sufficient out-of-door exercise, and by their close imitation of certain well-recognized physiological processes, will act as sufficiently and more satisfactorily than medicines. I have seen bad cases of dyspepsia insensibly yield to their influence, just as I have also seen obstinate constipation overcome by well-regulated massage.

One-half of the movements may be taken in the morning, and the remainder before going to bed. Clothed in a loose wrapper, or simply covered with a blanket, the woman should lie flat upon her back upon the floor, with her legs close together, and the arms extended by the side. The left arm

should then be *slowly* raised to a position perpendicular to the body, and then carried as far backward as possible. The arm is then to be as slowly returned to its original position. This should be repeated three times, and then resumed with the right arm. After a slight rest, the left arm is to be raised to the perpendicular, and then carried across the body to the right side. This also should be repeated three times, and then taken up by the right arm. Each leg is then to take up the movements just finished by the arms, except that, after gaining the perpendicular, they are not to be carried back toward the trunk. Another short rest follows, then both legs are to be raised simultaneously with the feet touching, the patient resting squarely on her back. This is to be practised three times. This movement is a difficult one, even for a person in robust health, but with each effort it will become easier. Then, turning over, resting upon her elbows and toes, the woman is to raise herself as much as possible.

Another exercise is for her to sit sidewise upon a chair having no arm-rests, and while the feet rest upon the floor, the body is to be bent backward as far as possible and then returned to an upright position. Each movement is to be practised three times. Then, standing erect, with the right foot resting upon a chair, and the hands upon the hips, she is to rotate her body from left to right, using her hips as a pivotal point. She then changes her feet, placing the left upon the chair, and rotates the trunk from right to left. She may then stand erect upon both feet, and placing both hands upon the head, with the arms bent, she may rotate the head in the same way that she has done the body. This movement of the head and trunk is of great importance in the treatment of dyspepsia resultant upon uterine disorder. It is marvellous how quickly some attacks are dispelled during the exercise. Should the uneasiness persist, brisk rubbing over the lesser curvature of the stomach will dissipate it. Any immediate muscular development is not to be expected. But a long and faithful continuance of these exercises will not only strengthen the weak places, but will promote digestion, overcome intestinal torpidity, induce refreshing sleep by occasioning a healthy weariness, and will surely and certainly increase the measurements of different parts of the body.

They have, too, a psychological significance, not unworthy of notice. They suffice to withdraw the mind from a morbid self-introspection and to interest it in something novel and unusual. The contemplation of one's aches and pains is lost in the conscientious carrying out of each detail and is finally merged into the general sense of muscular effort which induces natural sleep.

If obstinate constipation prevail, I know of nothing so valuable as massage. Many women complain that, although they have a natural desire, yet they are unable to empty the rectum entirely. The feces refuse to pass the internal sphincter. Having slightly moistened the tips of the fingers of the right hand, they should be pressed gently over the cecal region, then they should be carried up over the ascending colon to the right hypochondrium. The movement should be continued steadily over the transverse colon for some little time, and the pressure should be considerably increased as the fingers are carried down the descending colon. With a slight rest, the movement may be resumed, and so continued for ten or even fifteen minutes. If the case be very intractable, and the patient cannot effect the desired result herself, a nurse may easily be trained to do it for her. A few daily repetitions will be sufficient to excite a normal peristalsis, and we need have no recourse to the constant use of cathartics or laxatives. We merely lead nature back to the original path which she has lost through neglect and sickness.

Every woman should go to the water-closet at a fixed hour each day, that the bowels may form the habit of regularity, and she should remain there, without straining, until she has an evacuation. In order that no mental action may interfere with the physiological process, it is well for her to occupy herself with a book or newspaper while thus engaged. Constipation is one of the greatest evils which we have to guard against in the treatment of diseases of women, hence such suggestions as these will not be without merit. If the movements be persevered with, and massage made use of when demanded, very little, if indeed any, medicinal treatment will be needed in overcoming these almost constant symptoms of dyspepsia and constipation. A properly instructed attendant will be able to rub away a

nervous headache as if by magic, and a good masseuse will cure the most obstinate cases of insomnia.

A tepid bath of sea salt upon going to bed is of great service in the management of these cases. The sponging of the body to be followed by brisk rubbing with a Turkish towel. The clothing should be loose around the hips, and its weight supported by the shoulders. The heels of the shoes should be square and low. This latter should be insisted upon by the physician and should never be lost sight of.

In certain conditions of retroversion with descensus the patient should be instructed to assume the knee-chest position after exercising, to open the vaginal lips, and to perform each respiratory act with completeness. The air acts as a natural pessary, and the complete inflation of the lungs helps to draw the uterus upward. This position may be maintained for ten minutes at a time.

When occasion demands the use of the chamber vessel, it should be placed upon a chair or on some elevated article of furniture, and she should never be permitted to use it in any other way.

Of the management of the menstrual period much difference of opinion exists. Perhaps the best plan is to allow the woman to do that which she feels most like doing. If it pleases her to rest, she should rest. If she desires to walk, such exercise may be permitted. She should go to bed early, and as the completion of even one-half of her movements will consume from one-half to three-quarters of an hour, nine o'clock is quite late enough. She should refrain from indulging in any amusement after dinner that may have a tendency to excite her or to keep her awake.

As to diet, I *know* that one consisting largely of milk is very desirable. Vegetables and good ripe fruit are especially demanded where constipation exists. When not under rest treatment, I usually order from four to six glasses of milk per diem, the first to be taken upon awakening, and the last just before retiring. Hoff's malt at each meal may be added with advantage. A plain, wholesome, nutritious diet, the avoidance of late hours, and of social dissipation are, of course, pre-requisites of success. If menstruation be painful, or delayed beyond the usual period, a simple movement of the thighs, known to every

competent masseuse, has proved itself most useful. Tea and coffee are generally, if not always, contra-indicated.

The patient should not consider herself an invalid, except in guarding herself against such excesses as might do her injury. She should be allowed to do pretty much as other women do, provided the uterine difficulty has received local attention. A certain amount of mental and physical employment is essential. If the dislocated uterus has been restored, she may exercise, go up and down stairs, attend to her household duties and read, just as though she had never been ill.

The strong influence of the mind drags many a woman into a condition of extreme nervous exhaustion, who may have no serious trouble with her womb. Hence it is that such a condition should be "frowned down" upon every occasion. The woman should not be coddled and wept over whenever a "spell" seizes her. She must be forced into the belief that she has it within herself, by the exercise of her will, to overcome such nervous weakness. A proper communion with nature and with healthy people will withdraw the mind from constant introspection, and a proto-typical cerebral reaction will restore it to a normal condition. Excess of sympathy, excess of attention, and the manifestation of great alarm aggravate these periods of "nervousness" in an exceeding degree.

Of the use and abuse of pessaries I shall have something to say in a future paper, but if one has been applied, the patient should know how to remove it, and what set of symptoms call for its immediate removal. I feel satisfied that proper attention to these minor details of gynecological praxis are of the utmost importance and are essentials in any well-directed plan of treatment. There is something more required than the introduction of a pessary, the adjustment of a medicated tampon, and the use of hot water.

Such is the intimate association of the uterine plexus of nerves with the whole cerebro-spinal axis that a psychological consideration enters into the case. A long period of uterine suffering upsets mental stability, and this will not easily right itself, even after the primary cause of the trouble has yielded to treatment. This habit of unreliability which has insensibly obtained, can be overcome only by the formation of other and healthy habits of mind and body. These are best obtained by

change of scene and by association. The woman must be drawn out of herself and interested in something entirely different. There are hundreds of trials in the every-day life of a woman which a man cannot appreciate, and it is not until such a one has been withdrawn from their presence that she can respond even to the most scientific treatment. Every day gynecologists are admitting that a woman's psychological condition and surroundings are controlling factors in her well-being; that if these be congenial, even though her womb ache and suffer, she will do much better without interference than she could do with local treatment and irritating associations. The province of gynecology enlarges with a just comprehension of its responsibilities, and the specialist of to-day finds himself in a much larger and nobler field than his brother practitioner of twenty years ago.

A STUDY ON SOME OF THE CHANGES IN THE UTERUS AND
PELVIC DIAPHRAGM DURING LABOR.

BY

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New York.

(With two woodcuts.)

BEFORE entering upon the practical part of my subject, it will be necessary to consider some interesting and important anatomical facts pertaining to the topography of the female pelvis.

These facts have been brought to the notice of the profession, within the last few years, mainly by the observations of Braune, but also by those of Bandl, Chiara, Hart, and others. There is no part of the human body about which such erroneous views, as regards the topographical anatomy, have been entertained, as about the pelvic cavity of the female, though, at the same time, there is no part that has been more studied and written about. The older text-books on anatomy and obstetrics represent the pelvic cavity as containing a number of hollow tubes and smaller cavities, loosely bound together by connective tissue. These tubes and cavities are the rectum, the vagina, the blad-

der, and urethra, while the uterus is represented as suspended in some manner among these organs by certain ligaments. If such were the condition of the pelvic cavity in point of fact, the wonder would be, not that so many women had prolapse of the uterus, but that any woman, after bearing a child, could retain the uterus within the body. Nothing can be much farther from the truth than the above conception. The pelvis contains no hollow tubes or cavities, the vagina is a transverse slit, one to two inches in width, with an anterior and posterior surface in close apposition; this slit is not perpendicular to the outlet, but parallel to the brim of the pelvis—a very important fact. The bladder, either full or empty, has no cavity, and the same may be said of the rectum, the uterus, and the urethra. The pelvic contents, consisting of important organs, with connective, adipose, and muscular tissue, together make a solid partition or floor from two to three inches in thickness.

Dr. D. B. Hart, of Edinburgh, gives the following description:

“The pelvic diaphragm is, therefore, a thick compact layer, tunnelled by no cavities. Its thickness varies, being greatest at the centre, least at the sacral, and intermediate near the pubic attachments. In one of the sections, the thickness of the above points are, respectively, $2\frac{1}{2}$ inches, $1\frac{1}{2}$ inches, and 2 inches. The slits traversing it are all parallel to the pelvic brim—a fact of importance. By the ‘vaginal slit’ we get the pelvic floor divided anatomically into two portions, a pubic anterior, and a sacral posterior triangle.”

This description applies strictly to the non-puerperal pelvis, and has important bearings on gynecology, but it is substantially true of the puerperal pelvis up to the time of the beginning of labor. Figure 1, from Braune's frozen sections, an outline of which is given later, shows very plainly the thick, solid, pelvic diaphragm filling up the pelvic cavity, divided by the “vaginal slit.” A study of this plate, made from a frozen section of a woman who had died during the ninth month of pregnancy, but before labor had commenced, shows the following interesting facts: First, the solid pelvic diaphragm, made up of the bladder, the connective tissue in front of and behind the vagina, the urethra and the rectum, is easily seen.

Second, the bladder is seen to be behind and on a line with the pubis. The os internum, which is not well shown, must likewise be on a line with the pubic bone. The anterior uterine

wall is seen to be of some length, while the cervix uteri is very short. This, in brief, is the relation of the pelvic contents up to the end of the ninth month of pregnancy, and until labor commences. At the very beginning of labor, there are initiated certain changes in the relations of the pelvic contents and in the uterus, which become very marked at the beginning of the second stage of labor.

A comparison of Fig. 2, from Braune's frozen sections, made from a woman who died at the end of the first stage of labor, with Fig. 1, shows that the following changes have taken place

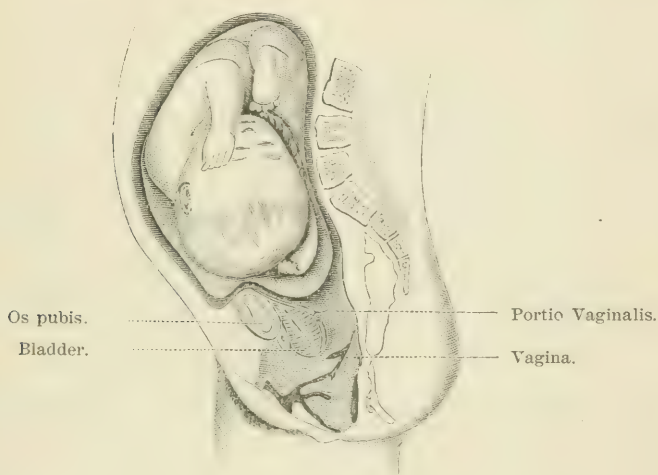


FIG. 1.

during the first stage of labor: First, the pelvic diaphragm has, for the most part, disappeared, to give place to the advancing head. The anterior pelvic triangle, that part lying in front of the vaginal slit, has gone upwards; the bladder is now seen at the beginning of the second stage above the pubis, and the urethra is stretched out into a tube some two inches in length. The lower uterine segment is dilated and retracted so that now the os internum, instead of being on a line with the pubis, is seen in front, two or three inches above it, and behind lies opposite the upper margin of the sacrum. The anterior uterine wall in Plate 2 is only one-half the length that it is in Fig. 1, and is very much thicker, thicker in proportion than the posterior

wall. There is now a marked contrast between the thickness of the wall of the body of the uterus and that of the cervix, the former being four or more times the thickness of the latter. It would seem that during labor the tissues of the body of the uterus grow thicker and shorter, while the cervix at the same time becomes thin and elongated. The cervix in Fig. 2 is seen merely as a line. The posterior pelvic triangle, which is of but little importance to the inquiry, is for the most part driven downwards into the hollow of the sacrum and into the perineum. There is one very important change that takes place during the first stage of labor that is not shown in Plate 2 at all.

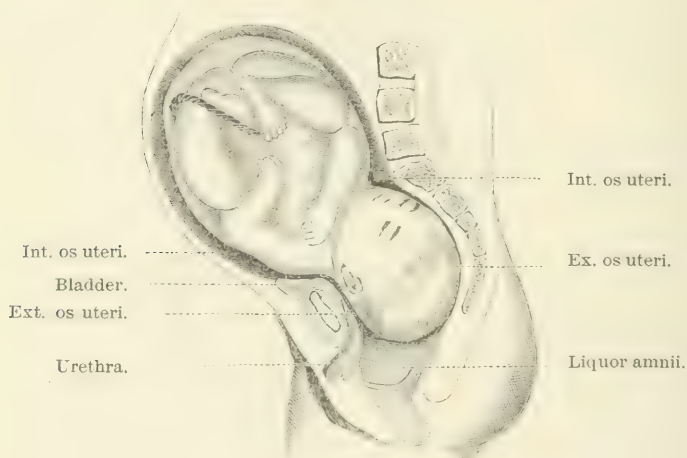


FIG. 2.

When the lower uterine segment dilates and is retracted upwards, carrying with it the bladder, the roof of the vagina in front of the cervix must, of necessity, be carried up with it, to a greater or less extent, thus lengthening the anterior vaginal cul-de-sac.

At the end of the ninth month of pregnancy, before labor has commenced, little or no anterior vaginal cul-de-sac can be discovered; but, at the beginning of the second stage of labor, the finger will pass up behind the pubis so as to map out much of its posterior surface. There is no sign that marks more surely the progress of labor, and is of more importance as a

means of diagnosis in obscure cases than this formation of the anterior vaginal cul-de-sac. It will be referred to later, and its importance more fully brought out. The truth to life of these plates from Braune cannot be for a moment doubted. Several observers have confirmed his positions. Prof. Chiara, of Milan, apparently without being aware of Braune's plates, for he makes no mention of them, has made similar plates from frozen sections. Dr. Hart, of Edinburgh, has done the same. Indeed, any obstetrician may make these observations, or some of them at least, for himself, on the living subject. As regards the position of the os internum, for instance, if he will carefully examine the next case of tedious labor he may have, especially if it be in a woman with thin abdominal walls, he can detect during a pain the point of junction of the thinned-out cervix with the thick, hard, and rigid wall of the body of the uterus. This will be discovered more readily after labor has continued some time, and, in such cases, the os internum may be felt two or three inches above the pubis. I have made this observation many times, and sometimes have felt the os internum two or three inches above the pubis, when the os externum was not yet dilated to the size of a silver dollar. In such cases, the cervix must be as much as six inches in length, and is as thin as parchment.

This would evidently be a predisposing cause for rupture of the uterus, the rupture commencing in the cervix near the os internum and extending up into the body of the uterus. It is supposed that in a majority of cases of this appalling accident, the rupture does commence in the cervix. Again, as regards the position of the bladder at the end of the first stage of labor, Braune's plate 2 represents it as being above the pubis. In a prolonged labor it may be detected some distance above the pubis, appearing as a bulging tumor on the anterior abdominal wall, perhaps reaching half-way to the umbilicus. This will occur when the bladder is not and has not been distended with urine.

In this position it frequently misleads the obstetrician into thinking that the bladder is over-distended with urine, and that it will be necessary to use the catheter before labor can go on. The catheter will be introduced with some difficulty, and instead of half a pint, barely an ounce of urine will be withdrawn. The obstetrician is deceived because, in a prolonged

labor, the bladder is retracted to a point that corresponds to its position when over-distended with urine in the non-puerperal state.

In the first case, it has been drawn up by the retraction of the lower uterine segment; in the second case, it has been pushed up by the pressure of retained urine. Dr. Litzmann, of Kiel, Germany, in performing the Cesarean section, for threatened rupture of the uterus, found, to his surprise, the summit of the bladder four fingers' breadth (three inches) above the pubis, although the bladder was nearly empty. He found, too, the peritoneum thickened and stripped off from the bladder so as to touch at its summit only; and the peritoneum was stripped off from the anterior wall of the abdomen in front of the bladder. It would seem to me that this fact of the normal retraction of the bladder, during labor, might have some bearing on the operation of laparo-elytrotomy.

It is a well-known fact that one of the most frequent and embarrassing accidents in this operation is the wounding of the bladder. Now, if by the natural progress of labor this organ tends to rise out of the pelvis and hence out of the way of the surgeon's knife, it might be well to delay the operation, and allow labor to go on as long as could be done with safety, in order to allow the bladder to retract. If, for instance, one was called early to a case where this operation was indicated, it would perhaps be well to dilate the os with the fingers and the Barnes' dilators, and then delay the operation as long as possible. So far as I am aware, this point has never been brought out in the discussion of this operation, and may be more fanciful than practical. I leave it to others to decide. The reason for these changes in the position of the bladder and os internum during labor is not far to seek; it must be due to the thickening and shortening of the anterior wall of the uterus, so well shown in Braune's Plate 2.

There is a loose connection between the lower uterine segment and the bladder. Now when the body of the uterus shortens, the os internum and the parts connected with the lower uterine segment must be retracted to a greater or less extent. I remember that one of my first obstetrical cases was a woman with prolapse of the bladder. The vesicocele was so marked, that all through the ninth month of pregnancy the tumor appeared at the vulva. I awaited the labor with great

anxiety, supposing, of course, that as the head descended the bladder must, of necessity, be pushed before it out of the body, and thus labor would be interfered with, if no further harm were done. My fears were groundless, for the bladder went up out of the way before the head descended. I have never seen an explanation of the fact given, but it must obviously be due to the retraction of the lower uterine segment and parts connected with it.

Thus far we have considered the anatomical and physiological changes that take place in the uterus and pelvic diaphragm during the first half of labor. These facts are not only interesting and novel in themselves, but they throw a flood of light on that mysterious process by which the human being is brought into an independent existence.

But these facts should not be dismissed simply as interesting. In science, every new fact must modify the theories and conceptions with which it is connected; and so these facts should have a bearing on the teaching and practice of obstetrics. Hence there must be practical deductions to be drawn from the study of the changes in the uterus and pelvic diaphragm during labor. The first deduction is that our conception of the first stage of labor needs to be enlarged and broadened. This stage in a normal labor is not alone a dilatation of the os externum, as usually taught, but a dilatation of the whole parturient canal.

It has been seen that, during the progress of the first stage of labor, the os externum dilates; the lower uterine segment dilates and retracts; the pelvic diaphragm disappears; the anterior triangle being carried upwards, for the most part, and the posterior downwards. Hence a true conception of the first stage of labor must include all these facts. A correct definition must include the most constant and important of them. Now the usual definition of the first stage of labor turns exclusively upon the condition of the external os. If this be undilated, then, no matter if the lower uterine segment be fully dilated, the labor is said to be still in the first stage.

It is not a difficult matter to prove that, in many cases, the os externum is totally unreliable as a sign of the progress of labor. An accidental rupture of the membranes at the beginning of labor may interfere with the normal dilatation of the os, and thus destroy its value as a sign of the progress of labor. A malposition of the child's head, adhesion of the lips of the cer-

vix, spasm of the circular fibres of the os, and many other causes that we cannot determine, may not only make the os externum unreliable as a sign of the true progress of labor, but may make it misleading in practice. I have said previously that I have seen the lower uterine segment fully dilated and the os internum retracted to a point two or more inches above the pubis when the os externum was not yet dilated to the size of a silver dollar. A number of cases illustrative of this point will be given later. Indeed, I am of the opinion that, as often as once in ten or twelve cases the os externum does not dilate in harmony with the parturient canal as a whole. Hence giving our exclusive attention in our examinations to the condition of the os externum, and judging from it as to the time when interference in the case by the forceps or other means is indicated, can but lead to many mistakes.

It is time then that this old definition should be discarded, and a truer and more scientific one substituted.

It might not seem of great practical importance that an inexact definition has been used in obstetrics. "A rose by any other name would smell as sweet," and likewise a mere term or definition, it may be said, could not confuse us as to the fact, in medicine. Never was there a greater mistake; the truth is, that an inexact and unscientific definition of the first stage of labor has been the cause of an almost infinite amount of confusion in teaching and in practice.

One teacher says that the first stage of labor is harmless to mother and child, though it be prolonged for days; another says he has seen dangerous exhaustion occur before the os was dilated, and the first stage completed. Hence the first stage is *not* harmless if long continued. One says the forceps should never be used until the os is dilated, because there is no harm in delay in this stage; another applies the forceps when the os is only one-half dilated, as often as once in every seven forceps cases. This is the position of Dr. Johnston, of Dublin.

One teacher condemns digital dilatation of the os, or any interference with its natural dilatation; another practises it frequently and always with benefit. So throughout the so-called first stage of labor, there is neither rule nor principle to guide the practitioner. He must have years of experience before he has acquired that obstetric sense that will lead him to form

unconsciously a right judgment as to these points, where teaching is so contradictory.

Has not much of this confusion arisen from a false definition of the first stage of labor, and hence from the classing of different stages of labor under the same head? In some cases, delay is harmless when the os is undilated, but in other cases not. The os externum itself, however, furnishes no sign that will lead us to make a differential diagnosis. If the definition of the first stage of labor be the progress of labor, up to the point when the lower uterine segment be fully dilated and the os internum retracted, then we have some definite and constant condition to guide us. If our attention be turned from the dilatation of the os externum, which is an uncertain and often accidental condition, to those changes in the uterus and pelvic diaphragm that are constant and certain, then we shall have a conception of the first stage of labor that will throw a flood of light on these vexed questions, and cause these contradictions to disappear like mist before the sun.

This false teaching (false because the starting definition is false) has had and still has an immense influence on our practice. Take that ancient and still accepted dogma, as to the harmlessness of the first stage of labor, for instance. Who can estimate the amount of injury that has arisen from it, founded as it is on a false definition of the first stage of labor? Let me give some illustrative cases that have occurred, not in the practice of ignorant men, but under the observation of men eminent as obstetricians. The report of a few such cases by these men indicates that there are hundreds of similar cases occurring in the practice of men less skilful, that are not reported at all. Dr. Johnston, of Dublin, then master of the Rotunda Lying-in Hospital, I believe, allowed a labor to go on without interference because the os did not dilate, and labor was supposed to be in the harmless first stage, until a ring of the cervix was torn off, by the pressure of the head of the child. Taught by this accident, he rejected the dogma of the harmlessness of the so-called first stage of labor in all cases and has become the apostle, as it were, of the early application of the forceps, even before the os is dilated.

A case reported by Dr. John Byrne, of Brooklyn, in 1878. It was reported as a case of acute inversion of the uterus and a new method of reduction. Continuing his report he says: "In the same way passed a third night and the follow-

ing Thursday, and even yet the os uteri remained absolutely uninfluenced." On Thursday night, he again administered anodynes, large doses of chloral, bromide, etc. "And on Friday morning, ninety-six hours from the beginning of labor, the os was dilated to the size of a twenty-five cent piece only. This process so tardy to begin was equally slow in its progress, there being but little gain during the entire day, and at the expiration of twenty-four hours more the cervix might be said to have been half dilated; nor was it until the afternoon of the next day (Saturday) *the sixth day of labor*, that a dilatation of two-thirds of the entire extent had been accomplished. . . . Her pulse was now becoming rapid and feeble; her countenance betrayed evidence of great anxiety and physical exhaustion," etc. He then delivered the woman with forceps, during which operation she nearly died from exhaustion. The delivery was followed by inversion of the uterus, unaccompanied with hemorrhage. On account of the extreme exhaustion of the patient, the inversion could not be reduced for nearly a week. He says that he did not use manual dilatation of the os during the labor on account of the extreme irritability of the patient. Not long ago, a case was reported by an intelligent practitioner visiting in a country district in New Jersey. He was there called upon to attend a neighbor in confinement. The labor went on hour after hour without much dilatation of the os. The attending physician, regarding the case as in the harmless first stage, did nothing for her relief except to give anodynes. At length symptoms of exhaustion appeared, and before assistance (summoned from Philadelphia) could aid her, the woman died.

These cases are brought forward, not for the purpose of criticising the practice of the attending physician, but to illustrate the evil influence of a false definition and a false dogma.

Is it not evident from the language of the reporters that their attention was mainly directed to the condition of the os externum, which in these cases, for some unknown reason, did not dilate? Not a word is said in the reports about the condition of the os internum and pelvic diaphragm; but is it not probable that long before exhaustion of the mother appeared, the contraction of the uterine body had brought about dilatation and retraction of the lower uterine segment and thus put the labor in the true second stage? It is admitted by all that lengthened delay in the second stage is accompanied with more or less danger,

and hence, if the attending physician had been guided by the os internum and the anterior vaginal cul-de-sac instead of the os externum, he might have interfered long before extreme exhaustion declared itself. A case occurring in my own practice, a few days ago, will serve to further illustrate this position.

E. T., a primipara; twenty-four years of age; in the latter part of the ninth month of pregnancy, received quite a severe blow on the abdomen. Shortly afterwards, slight pains commenced. I examined and found the pulse good; the os externum closed; cervix thin, and anterior vaginal cul-de-sac very slightly marked. The blow on the abdomen had had no bad result except to cause a premature rupture of the membranes.

I left word that I was to be summoned as soon as true labor came on. Not hearing anything from my patient that night, I concluded that the impending labor had passed over for a time. The next day I called at the house to see a sick child, I found that my patient, whom I had seen just twenty-four hours previously, had had pains ever since, though they were not thought to be severe enough to require my presence. I found the woman walking about the room, looking fatigued and complaining of frequent but short pains. On examination I found the os externum dilated to one-third of its size; the cervix thin; the lips soft, moist, and dilatable; and the vagina cool and moist. Had my examination ended there, I should have thought that my patient was still in the harmless first stage of labor; but on further examination I found, much to my surprise, the anterior vaginal cul-de-sac well formed; the bladder retracted up towards the umbilicus, the os internum some distance above the pubis, and the woman's pulse 150 per minute and feeble. The friends were informed that the woman was in a critical condition, and a messenger was dispatched for my forceps. Meantime I commenced digital dilatation of the os, and in three-quarters of an hour the os was fully dilated. The delivery by the forceps was not at all difficult. When the head pressed on the perineum, the forceps were removed to see if the natural forces would not expel the child, but the pains were powerless. I reapplied the forceps, and simply lifted the head, so to speak, over the perineum. No anesthetic was used for fear of hemorrhage. A post-partum hemorrhage that commenced was speedily controlled by an injection of a weak solution of tr. iodine. Six days after the confinement, my patient's pulse was still 120 per minute.

Here was a case where, as far as the character of the pains, and condition and amount of dilatation of the os externum indicated, was yet in the so-called harmless first stage of labor. The lower uterine segment, however, and the retraction of the anterior pelvic triangle showed that the labor had been in its true

second stage for some time, and had I waited for the os externum to dilate of itself, before giving assistance, the delay would probably have been fatal.

In this case, to be sure, the great rapidity and weakness of the pulse indicated danger.

In regard to the pulse as a practical symptom in obstetrics, this much needs to be said: First, the pulse, varying as it does normally in different persons, through a long range, is an inexact and unreliable sign, except it be markedly feeble. Second, that the administration of remedies, such as morphia, which is almost invariably used in these cases, will keep the pulse slow until extreme exhaustion appears, and thus the value of the pulse as a symptom is again interfered with. Third, that it is unnecessary, harmful, and cruel to delay assistance until the pulse indicates extreme weakness. The pulse is only one sign (and that not a very reliable one) of a number of signs that would influence our judgment.

It may be well to speak here of the value of the anterior vaginal cul-de-sac as a sign of the progress of labor. It is of great value in cases where the os externum does not dilate in harmony with the lower uterine segment, and hence in those cases where the usual signs are of no use as a means of diagnosis. When the os dilates rapidly, the anterior vaginal cul-de-sac will not be so well marked.

The study of the changes in the uterus and pelvic diaphragm during labor offers a solution to another vexed question in obstetrics, namely: the application of the forceps before the os externum is dilated. Dr. Johnston, of Dublin, and Dr. Isaac E. Taylor, of New York, are the prominent advocates of this operation.

Dr. Johnston employs this operation in one out of every seven forceps cases. In nearly one-third of these cases, the forceps are used when the os is two-fifths dilated.

The majority of the profession, especially in Great Britain, regard this teaching as of a dangerous tendency, though the practice in the hands of such skilful men may be good. The limits of this paper will not admit of an extended discussion of this subject, but this much may be said: however good the practice may be in the hands of advocates of the operation, yet all practitioners have not that obstetric sense, that *tactus eruditus* that will guide them safely in the use of this operation.

Hence, unless these gentlemen lay down some rules or principles for our guidance, their experience can only be of value to themselves. If they bring forward numerous cases where the operation has been of undoubted value, an equal number of cases might perhaps be found where less skilful men, following in their footsteps, had done great harm. So far as I am aware, no simple principle has been laid down that will make the operation a safe one for the profession to use. Certainly the condition of the os externum alone is not a reliable guide as to when the operation is indicated. I would suggest that the operation may be of value in any case where the os externum does not dilate in harmony with the dilatation and retraction of the lower uterine segment. In such cases where the os and cervix alone stand in the way of delivery, the forceps simply act as a dilating force from within. A careful steady traction on the forceps, combined with a gentle stretching of the distended ring of the os by the fingers, ought to bring about dilatation and delivery of the child, without laceration of the cervix. If the dilatation and retraction of the lower uterine segment have not taken place, the application of the forceps and traction will simply bring the head *and uterus with it* down into the pelvis. Continued traction, then, must be accompanied with danger.

The lower uterine segment *must* be dilated and retracted before the child can be delivered, unless indeed a passage be made through the continuity of the tissues. The operation, then, is of value if employed in suitable cases, and may be employed by the profession under the guidance of these simple principles.

I have employed the operation frequently, and in some cases where, although the lower uterine segment was dilated, except the os externum, which was as thin, rigid, and unyielding as an iron stove-pipe. In such cases, after applying the forceps, and finding that no reasonable amount of traction would dilate the os, I have then made numerous shallow incisions into the tense ring of the cervix with a guarded bistoury or scissors. The os has then dilated, and the child has been delivered without laceration of the cervix. There is another deduction that may be derived from the study of the changes in the uterus and pelvic diaphragm during labor. It is usually stated that the dilatation of the os is brought about by the descent of the head, and pressure upon os and cervix. This, it seems to me, is only a minor fac-

tor in causing dilatation. The true dilating force is a change in the uterine polarity and the shortening of the uterine body by the contractions of the longitudinal fibres of the uterus. The os externum is more drawn back from the occiput than it is pushed back by the descending head. In the majority of cases, the head descends in the pelvis but very little during labor until the os is fully dilated.

Digital dilatation of the os is a question upon which the profession is at variance. At one time, during the teaching of the elder Hamilton, the profession of Edinburgh was divided into two hostile camps on this subject. One side assigned all sorts of evil to the practice, such as inflammation and laceration of the cervix, edema, and irregular dilatation of the os, etc. The other party claimed that the procedure was often useful, and, in some cases, necessary. From that day to this, the question has never been settled, though the preponderance of teaching is against the practice. Of course, cases where there are complications, such as placenta previa, uremic convulsions, etc., are excluded from the discussion. This vexed question is not very different, it seems to me, from that of the application of the forceps before the os is fully dilated. In both cases, the object to be obtained is dilatation of the os externum. In one case, traction is combined with a dilating force, and the operation will be indicated when the os is undilated, and the expulsive force of the uterus is very weak. In the other case, a dilating force alone is employed. Neither operation should be thought of until the lower uterine segment has dilated, and the os internum and pelvic diaphragm have been retracted. When these changes have taken place, and the os externum has not dilated in harmony with these changes, then digital dilatation may be resorted to with safety and advantage.

If only a thinned out and easily dilatable os and cervix stand in the way of delivery, there can be no good reason for allowing a woman to suffer hour after hour until exhaustion is imminent, and the forceps are indicated, out of respect to the *noli me tangere* doctrine, as regards the os externum.

In my own practice, I employ digital dilatation of the os as often as once in every ten cases, and I have yet to see any injury from such a practice. Of course, if this procedure be resorted to indiscriminately, or to save time, or at any time when the indications are not clear and precise, then digital

dilatation of the os, like the indiscriminate use of the forceps, may be productive of an immense amount of harm.

The simple rules that I have found useful in practising this manœuvre are as follows: First, digital dilatation is not indicated until the parturient canal, with the exception of the os externum, is dilated or ready for dilatation. This may be known by the position of the bladder and the os internum, but principally by the development of the anterior vaginal cul-de-sac. This last sign is of *especial* importance in just these cases where the os externum does not dilate, and hence does not indicate the true progress of labor. The cervix will be thin and tense; the membranes may or may not be unruptured. Second, the method. Two fingers are usually employed, inserted within the os, and then pressed gently towards the child's occiput. An indiscriminate stretching of the os is not the proper method of procedure. The object should be to liberate the occiput from the cervix while the forehead is still within the os. Thus flexion will be assisted, and the shortest diameters of the head come into the appropriate diameters of the pelvis. If the position be L. O. A., the dilating force should be towards the left acetabulum; if R. O. A., towards the right acetabulum, and so on for the different positions of the head; the dilating force being always directed towards the child's occiput. The force employed need be but slight, and, in many cases, need be employed but for a short time. After dilatation has reached a certain point, it will often go on of itself without assistance. In some cases, after full dilatation is reached, the anterior lip of the cervix still remains down between the occiput and the symphysis pubis. In such cases, the anterior lip should be lifted during a pain toward the occiput. There are points, advantages, and disadvantages of this operation that might be discussed, but the object of this article has been more to make suggestions for further study and investigation in this line than to lay down a complete system or convince an opponent.

The study of the changes in the uterus and pelvic diaphragm during labor, as revealed by frozen sections and by observations on the living subject, would seem to reopen nearly the whole field of obstetrics to new investigation.

ON RETAINED PLACENTA, WITH SPECIAL REFERENCE TO
UTERINE INVERSION.

BY

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THE act of parturition is not finished until the placenta or afterbirth is extruded inclusive of its membranes, with any remaining amniotic fluid, and such liquid or coagulated blood as may be present in the uterus after the child has been removed by severance of the umbilical cord. The term *delivery*, as used by the older authors and by the French, or *deliverance*, as the phrase is employed with ourselves, really means the completion of the labor through which the parturient uterus has just passed, its final act being the absolute removal of every foreign body from the womb; and anything remaining in that organ after the birth of the infant, although it may have been normally present anterior to that extent, is a foreign body. Under ordinary conditions, the uterus is competent to empty itself of all its contents at full term and does so without external assistance in natural labor. In other instances, more or less aid is demanded from and supplied by the physician, so far as pertains to the passage of the child through the straits of the pelvic basin, but in the majority of these cases also the third stage of labor is successfully terminated through the voluntary efforts of the womb to attain firm contraction. Unfortunately, however, nature at times does not and cannot complete its work unless assisted, and various causes contribute toward this exceedingly bad and dangerous condition. A prominent and perhaps the most common defect in such cases is atony of the uterine muscles, tired out, it may be, from a long and exhausting labor. Here a longer or shorter rest will often allow a recuperation which, with judicious traction and moderate abdominal pressure, or gently performed Cr  d  's method, will accomplish our purpose. Failing uterine strength can also be aroused by the administration of ergot, although I must confess that per-

sonally, for some years past, my belief has been that this drug is in all stages of labor much less valuable than is generally supposed, and that in the third stage it is as likely to do harm as to do good by acting on the cervical fibres and pursing up the os, thus defeating the very point aimed at. Until definite professional opinion is agreed on this point, when judiciously managed it may be conceded as of service in connection with other means.

A second difficulty less frequently encountered is hour-glass contraction of the womb, the placenta being thereby imprisoned within the upper cavity, or nipped by the constricting fibres. The worst cases of hour-glass contraction which have come under my notice have been in women to whom ergot had been given freely to expedite delivery of the afterbirth, and in one of them the larger portion of the placenta had been removed, but a part yet remained twenty-four hours subsequent to delivery beyond the contracture without the attendant's knowledge. The constant distress resulted in my being called in after her physician had retired, he supposing the uterus to be empty. The ergot ingested made the dilatation of the band and removal of the fragments a matter of considerable difficulty, but the patient, though tedious in convalescing, ultimately recovered without complication.

A third hindrance to placental extrusion is a morbid adhesion of the mass to the uterine wall. Under such circumstances nature imperatively demands the aid of the accoucheur, and that in a well-directed and thorough manner. An abnormally adherent placenta will not spontaneously loosen in a reasonable time, and I hold that it is criminal in the medical attendant to leave the lying-in chamber until the afterbirth is wholly extracted, the uterine globe firmly condensed, and all danger from immediate or foreseen hemorrhage averted. It has been held by eminent authority that, as the expulsion of the placenta is a natural office, it should be left to nature invariably, and in reliance upon this dictum, and in accordance with the old platitude that "meddlesome midwifery is bad," many a life has been lost which should and would have been saved had the practitioner been capable of self-reliance, instead of shirking his duty behind such like lame excuses. In a valuable and interesting paper read before the Philadelphia County Medical

Society, October 13th, 1880,¹ the author, in reply to a question, stated that he had frequently permitted the placenta to remain from eighteen to twenty-four hours, and in one instance for thirty-six hours, without untoward results. As this avowal has been made before by equally capable gentleman, and more than one member present seemed to regard the method as good practice, the writer of this paper deprecated the proposition and asserted that "sooner than allow any portion to remain and thereby endanger systemic poisoning, he would, other means failing, *invert the uterus* and peel off the placenta; the danger incurred, of non-ability to replace the organ, being, in his opinion, preferable to that of permitting an appreciable mass to become the starting-point of hemorrhage, inflammation, or pyemia." The narration of a case in point was promised at a future time, but opportunity has not offered, and as all the members of the Society either do or should take this JOURNAL, it is now herein reported, with the added advantage of wider publicity.

Experience in medicine pre-eminently is the best teacher, and much as we respect and rely upon the dogmatical utterances of the professors from whom we imbibe our early knowledge of the healing art, we learn, with regret, that they, alas! are not infallible, and in the lapse of years see the necessity of personal study of cases and self-reliance. To show that the position taken by myself is justified in the matter under consideration, before giving the case I wish to refer to another in which the delivery of the placenta was left to nature, and its outcome.

In the summer of 1868, I was stationed at a military depot in Alabama, on duty with the troops at that post. The wife of a hospital steward, who had been temporarily assigned to duty there, was taken in labor one morning, and in the absence of my associate surgeon with whom the steward had been serving, and who had intended officiating, I took charge of the case. The labor (her second) was in all respects normal, and toward evening terminated in the birth of a moderate-sized boy still-born. Neither ergot or forceps were used, and after waiting some fifteen or twenty minutes, I saw that the placenta would not come away without more positive assistance than the frictions of the abdomen which had been practised. A digital examination showed the womb to be

¹ "Hemorrhage Incident to Parturition," by Dr. George Hamilton, Philadelphia Medical Times, Nov. 20th, 1880. and Proceedings Philadelphia County Medical Society, Vol. III., p. 14.

well condensed, the os patulous, and the secundines firmly adherent to the fundus. I requested the steward to assist me by counter-pressure externally whilst I peeled off the afterbirth, and he informed me then that the same complication had accompanied her first accouchement. Just as we were about to begin the operation, my colleague entered the room, having returned from a botanical or mineralogical excursion, and he vehemently protested against any interference with natural delivery, notwithstanding the previous history and the evident necessity of interference. He asserted his conviction that nature always was competent to finish the work, and quoted his collegiate instruction to that effect, as being superior to my ideas or those of my instructors. Seeing that he fell back upon his rights as having been her attending physician before joining the post, and a disposition to assert his seniority of rank (he antedated me by commission a few days), I resigned the further conduct of the case into his hands, feeling, however, that his superior knowledge of the anatomy of a clam and his geological learning were not equivalent to the necessities of the patient. Eighteen hours subsequent to his assuming control, a chill set in, followed by high fever, and through my urgent entreaty with the general commanding the district, my friend, Dr. Dement, of the city, a gentleman of large experience and formerly a medical director in the Confederate Army, was called into consultation. He urged the removal of the placenta, and we together got away nearly all of it, but putrefaction had already set in and systemic poisoning had ensued. In seventy-two hours thereafter she died—a victim, I firmly believe, to mismanagement, to use a mild term only.

That was the first instance in my obstetric practice which had terminated fatally, and although morally and legally I was blameless, I vowed that thereafter, come what would, a woman attended by myself should be *delivered* in the full sense of the word before I left her room. My experience in obstetrics has been in the last twenty-two years fully up to the average, and although I have lost cases from peritonitis and other unavoidable sequelæ, no patient has slipped through my fingers by hemorrhage, retained placenta, or other accidents referable to imperfectly managed parturition. The case which I intended presenting to the Society in sustenance of my assertion, as above quoted, is as follows:

In the spring of 1878, I was rung up one Sunday morning, before daybreak, to assist a neighboring physician with a lady who had been in labor for about thirty-six hours. She had been married some thirteen years without issue, and, being well on to forty years of age, was not a promising subject for an easy labor. The doctor had wasted a large quantity of ether in an effort to

anesthetize her previous to the application of forceps. The nurse proving a bad assistant, he called me, and without difficulty she was rendered insensible, and the delivery of a large female infant successfully accomplished. The perineum was somewhat torn by the shoulders, and the woman recovered consciousness whilst we were inducing respiration in the baby. Having established its breathing, our attention was directed toward the mother, and no attempt at placental extrusion having occurred, my friend proceeded to remove it manually with my assistance. Cr  d  's method, which I invariably resort to, had failed with each of us. Upon reaching it high up, he found it to be rigidly adherent, and all his efforts to detach it at any part of its edge were futile. Being tired from prolonged attendance, he asked me to try, and without removing my coat, which I had put on, I vainly sought for several minutes a point from which to peel the edge, but the adhesion was so firm, and the fusing of the placenta with the uterine wall so perfect, that I could not succeed. I withdrew my hand, and, taking off my coat, proposed to bore through the mass close to the insertion of the cord, and by steady but gentle traction thus possibly separate the afterbirth at a central spot and work toward the circumference, any air which might find its way beneath it during the man  uvre helping the procedure. Whilst I was rolling up my sleeves, he again introduced his hand and forcibly detached a piece as large as an orange, and after bringing away several portions he turned her over to me. I found the remainder torn into masses still glued fast, and after considerable effort the uterus was emptied, but the patient was greatly exhausted by the prolonged manipulation. I have repeatedly extracted a retained placenta, but the work required in this instance exceeded anything I have encountered before or since. She had extremely foul lochial discharges, high fever, dirty tongue, tender abdomen, tympanites; in short, a decided tendency for two weeks to septic infection, but carbolized injections, quinia, morphia, and liberal diet brought her through a critical lying-in, and convalescence was eventually attained with much worriment on my part. I was sorry that the afterbirth was broken up, for in such cases my efforts are directed toward removing it *en masse*, in order that small portions may not adhere undetected to the site of insertion. Toward the close of the year she became pregnant again, and she, with the advice of her former physician, engaged me to attend her when again confined. The next August saw her "once more in the straw," as her nurse termed it. The labor was short and almost painless; the child required no such attention as did the first, but the placenta was firmly adherent to the fundus. I explained the necessity of fortitude during the removal, but she was extremely nervous, and after washing out the womb and vagina thoroughly with carbolized water I went into the adjoining bath-room to oil my hand and forearm. Whilst doing so, the nurse dragged strongly, I suspect, upon the cord, hoping to avert the proposed manipulation, and

on placing my left hand over the hypogastrium I found the hitherto large uterine globule low down and smaller. My idea was at first that nature had done its work, and on making a digital investigation, sure enough I touched the placenta lying upon the perineum, but a moment later I recognized a partial inversion of the womb. Recollecting the hard work encountered in her first labor, I determined to take the chances of complete inversion, and, although the replacement might, at the instant, have been easily done so far as I know, *I deliberately completed the inversion by traction and supra-pubic pressure.* The greater part of the afterbirth was now in sight, but the globe was somewhat relaxed. To condense it I gave her a drachm of Squibb's fluid extract of ergot under which the mass visibly contracted. The peeling was at once begun, and after some little difficulty the edge was found, and the entire placenta detached, with a fraction only of the trouble formerly endured. After removing it I found wherein I had blundered, for the womb was so strongly condensed as to resist the effort at replacement, the whole mass going up, but no dilatation of the os being had. Without wasting time in what I knew would be futile work, I anesthetized her for the double purpose of relaxing the muscular tone and rendering her more amenable to the probable prolonged manipulation. When fully under the effect of chloroform the womb *became decidedly flabby*, and it took a short time only to put matters into a normal condition. Once the fundus fairly got into the os—which took probably ten minutes to effect—two-thirds of the work was done, and it was not more than fifteen or twenty minutes from the time she was thoroughly anesthetized until replacement was complete. She was once more thoroughly syringed, one-fourth of a grain of morphia hypodermically given, no binder applied, and in fifteen minutes she was sleeping quietly. Two hours later, ten grains of cinchonidia sulphate with a quarter-grain of morphia was administered, and she passed a quiet night, awakening twice for a draught of water and feeling thoroughly refreshed in the morning. The catheter was not employed at any time; her bowels acted naturally from the day succeeding her confinement; her food, which was nourishing and as full in quantity as appetite demanded, was well digested; the lochia were not too profuse; and no indication of inflammatory complication was apparent at any period. On the ninth day, she took her dinner with the family down-stairs, and in two weeks she was fully engaged in her household affairs which were exacting. After having the nature of the operative measures explained to her, with the possible danger had failure to reposit the organ ensued, she unhesitatingly decided that my course was right, and begged that if she was unfortunately obliged to endure another labor, the same method would be repeated in case similar indications were present. Her former attendant was sick at the time and could not have assisted me, and I had no other aid than the nurse supplied. The lady's health was good for about eighteen months thereafter, and at that

time she again became pregnant. Her third labor was, though not so rapid as the second, quite easy, yet the placenta was adherent. She was perfectly willing, even anxious, that it should again be removed as before, but an examination showed it to be partially detached at one edge, and on failing to express it by Cr  d  's method, it was with little trouble removed by the hand in the uterus. Since the last confinement she has reached the menopause and enjoys perfect health. Her two last children are thriving; the oldest died from cholera infantum.

Puerperal uterine inversion has happened to me twice before this lady's case.

In the first it was complete,¹ and took place spontaneously within ten minutes after the child was born. The cord was amply long; the labor was in all respects normal; the womb was not at all inverted when the child cleared the vulva or when the secundines were discharged, for I invariably encourage the condensing of the uterus by holding it with my left hand, and it was, when I took my hand away, firmly contracted, globular, and high in the pelvis. Nevertheless, whilst waiting to dress the funis, after the infant was washed, she complained of undue flowing, and, on investigating the matter, the womb was found inverted and low in the vagina; in fact, it was partly extruded. I had the assistance of a professional friend, and we returned it without much difficulty. She has since then been confined several times without any abnormal symptoms.

The second instance falling under my notice was that of a forceps case, which I delivered for a friend. The child was large, the labor difficult and prolonged. After washing my instruments and hands, whilst waiting for the doctor to bandage her, she complained of excessive pain and declared that another child was coming. My friend, to quiet her, made an examination, and asked me to do likewise, believing the protruding mass to be a fibroid. I felt inclined to agree with him at first, because of the difficulty in clearly feeling the outline of her womb through the abdominal parietes, which were loaded with fat, but I suggested an effort to return the mass within the os. We almost gave up the job, being both very tired, but it finally yielded, and we had the satisfaction of completely reducing the protrusion before leaving her. She passed several large and hard clots for a few days, and imagined that one of them was a tumor, but as the nurse and husband agreed as to all the masses being friable and discoloring the water in which they were received, we could not accept the idea of a fibroid or like substance being voided. No doubt exists in my mind as to the case being one of partial inversion.

¹ By complete I mean that all of the organ, except about two inches of the vaginal portion of the cervix, was turned out. The vagina and bladder were not protruded in either case.

I report these cases for several reasons: *First*. It is evident that the placenta can be successfully and safely removed by the plan described, and without the terrible immediate and ulterior consequences noted by all the numerous authorities whom I have consulted, ancient and modern. The description of this accident is so nearly alike by all as to suggest the mere newspaper-clipping style, instead of deductions from personal observation of the authors or testimony from recent capable observers, and reminded me, in looking them over, of the geographical fictions studied wondrously in my boyhood, and which are now exploded. There was not in either case the horrible agony, the tenesmus, the frightful hemorrhage, the collapse, or impending dissolution as usually portrayed, and the reduction in each was not nearly so difficult to complete as I expected it would be, and unless we are better off than authorities describe, I had an exceptionally fortunate experience, especially in the instance where the placenta was peeled off after inversion and before reversion, for she got well promptly. The mortality is, I think, overrated, especially by Clay,¹ who gives it at seventy per cent, and this within a few hours after the accident.

Second. Authorities direct the replacement of the womb *before* the detachment of the placenta, and as statistics show inversion prior to the completion of the third stage of labor to be almost invariably associated with adherent placenta, it may be advisable to reconsider this point. It appears to me much easier to replace the womb unincumbered with a mass, bulky and heavy, which can also be detached more readily in its abnormal position, without the liability of again inducing inversion by the ordinary method of withdrawal, and hemorrhage can at once be arrested by hot carbolized water, vinegar, iodine, or iron, as the practitioner deems best, the bleeding surface being within sight.

Third. All interesting cases should go out to the profession for their comments or guidance, and whilst I confess my error in giving the ergot before attempt at reposition, and am willing to shoulder all invidious criticism, I feel justified with the memory of my case before me, in which death resulted from

¹ The Complete Handbook of Obstetric Surgery. By Charles Clay, M.D. Philadelphia: Lindsay & Blakiston, 1874.

retention of placental fragments. Further, when frantic efforts are now being made in some circles to carry out parturition under almost complete anesthesia, it is worthy of note that the rigid condensation of this woman's uterus was overcome completely by chloroform, and the organ so relaxed as to permit manipulation readily, from which I inferred then, as I have always believed, that anesthetics should be used cautiously in obstetric practice, and should be almost wholly confined to actual operative interference—as, for example, delivery with forceps or craniotomy. Personally, I rarely resort to ether or chloroform in obstetrics, but from experience with professional friends, I am convinced that hemorrhage is prone to follow the moderate use of either.

Lastly. Inversion is not a common accompaniment of labor. Meigs, in his large practice, saw only three cases, all of which recovered. These were accidental, and replaced with difficulty, by grasping the whole mass, compressing it, and indenting the fundus. In my two cases of complete inversion (all except the rim of the cervix being turned out), the reversion was made by Noeggerath's plan of indenting the insertion of one of the oviducts, at which point the wall is thin and more easily depressed. In the partial case, the portion was too small for grasping, and was pushed up forcibly until the cervix yielded and allowed it to pass. This woman suffered more during the abnormal condition than those whose inversion I considered complete, doubtless from nipping by the cervix, which was acting under ergot, and she also lost more blood through venous stagnation.

In closing this paper, I feel that in many respects it might be fuller, but time and space are wanting, and I give the facts briefly for what they are worth. I hope my readers will not meet with this distressing accident, both for their patients' good and their own; but if unfortunately they do, I trust the result will be equally happy as was mine, under the advanced means of antiseptic surgery, and the lessened mortality of late years in preterm labor. With a sincere desire to be as conservative in obstetric and gynecological operations as the just care of my patient demands, and condemning, as I have done repeatedly and publicly in medical journals, the prevalent unnecessary and indefensible tendency to radical measures

in uterine disorders, I would, under similar indications, again act as I did in the case described, with a clear conscience, believing it to be for the best interest of my patient.

NORTH TWENTIETH STREET.

EFFECT ON WOMEN OF IMPERFECT HYGIENE OF THE
SEXUAL FUNCTION.

BY
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CIVILIZATION is hard on woman. Stimulated to efforts beyond her strength, ambitions excited which she cannot reach, with opportunities restricted, directly and indirectly, by her sex, whatever she may have gained in civilization, it cannot be denied that she has lost tranquillity; and in losing tranquillity, she has lost much. All through animated existence, Nature requires repose for her most serious processes; and the most serious part, in keeping the race alive, woman enacts. She comes up to full womanhood with the endowment of her generative capacities as an ever-present influence, controlling her growth in mind and body. In ripe womanhood, her sex is overshadowing; and when her fruitage is past, its influence still surrounds her, like a glory, to her latest day.

The rapid progress of present events leaves little time for men to adjust themselves to the constantly varying situations; while women are made to sustain a strain which is always heavy and sometimes more than they can bear. It is not for me to adjudge the responsibility or to declare the perfect remedy. It is enough, for our present purpose, to ascertain the facts. And I believe the fact to be that the imperfect sexual hygiene of women is a prolific source of evil to them in particular and to the race in general; for men, on the whole, get along very well in civilization, notwithstanding some strong evil tendencies. At least, enough men survive in healthful vigor to sustain a vigorous race. If race degeneration shall actually come, it will come through degeneration of women;

and the one cause tending more than all others, in my opinion, to woman's degeneration, is her ill-regulated sexual life.

The part played in the economy of life, by male and female, varies greatly in different creatures. The lion spider, watching for prey, is the female. The male spider is too insignificant to be generally noticed. He lives for one purpose only; and after fecundating the female, she directly dines off his succulent body. The female bee is a veritable queen, contact with whom by the male is always instant death. In the domestic economy of those wonderful creatures, the ants, the workers are undeveloped females, the males having but the function of impregnating the females and then dying. On the other hand, many male birds take an active part in incubation and rearing their young—sitting on the eggs while the female is in search of food, as well as assisting in gathering it, and in feeding the fledglings. In fish, the parts taken are often very evenly divided between the sexes, though it is said that the male stickleback eats his spouse after she has deposited her eggs, and then proceeds to rear his family in peace and quietness. These few examples are intended to illustrate the truth that it is not accident that determines the relative time and occupation of the energies of male and female, in propagation, but that these relations are determined by the law of the organisms involved. In the human species, we know that the woman is largely engaged in carrying, nursing, and in rearing the young. But we do not always appreciate the extent to which her organism is thus involved. George and Mary are two young persons, reared in the same village, attending the same school, studying the same lessons, and, up to a certain time, are not very different to the casual observation. They marry: he to enter, with renewed energy and ambition, on his usual avocation and his determined course of life; while, with her, the very blood is changed in its course, and for two years, through gestation and lactation, she maintains a second being; and all her thoughts and feelings are moulded to accord with this new relation. And yet not new; for heretofore her bodily powers have been largely engaged in preparing for this period, and marriage is only a consummation of the absorbing influence of sex over a woman's life. In this proportion is woman's generative function more controlling than man's. And right here I shall be confronted by the objection that women have less sexual feeling than men, and it is

even claimed by some that, as a rule, women have practically nothing of what is understood as sexual passion. It is stated that three out of four married women take no pleasure in the sexual act, and to many women it is positively distasteful. I admit the facts, but deny the conclusion. I believe it is a great and injurious misapprehension to assume a want of sexual passion in women, because it is little obvious in civilization. Let me first give some reasons for the belief that the general sentiment that women, as a class, are naturally deficient in sexual feeling, is a mistaken one; and afterwards I shall proceed to indicate some of the injurious effects on women of this incorrect sentiment, and effects which grow out of it.

In the first place, there are physical reasons why a girl might be expected to become aware of her sexual organs much later than a boy does. His organs are external, so entirely within the reach of his senses that he cannot avoid both seeing and touching them at an early age. Then there are few boy children who do not early have erections from reflex influences, sufficient to awaken conscious sensations, and these are readily connected with the senses of sight and feeling. The boy thus early becomes conscious of peculiarities connected with his reproductive organs. Now, a woman never directly sees her genital organs, and in childhood there is less to connect, in consciousness, subjective sensations with those organs. And it is astonishing how many women arrive at maturity and have never connected, in their minds, the erotic sensations, which they may possess to a large degree, with the generative function. But, notwithstanding the physical reasons for ignorance of the location and nature of the sexual feeling, it is only through vigorous repression and mental influences exerted at the earliest day that girls are kept so ignorant as we find them. It is wonderful at how early an age girls do find their sexual organs. There can be no doubt that, all things considered, they are early directed, by the erotic sense, to their location. An evidence of this is that, in my experience, girls are quite as liable to contract the habit of self-abuse as boys; and, when once formed, it is more persistent in girls than it is in boys. I lately visited an asylum for weak-minded children of both sexes. I found, on inquiry, that self-abuse was very frequent among them, and that the girls were quite as much addicted to it as the boys. Of course, many are taught by one another; but it is also unquestionably true that

many take it up without previous example, from the sexual instinct alone.

In the institution referred to, there are about one hundred girls and one hundred and eighty boys. The supervising nurse is a woman of quick perceptions and sound judgment and is well known to me to be reliable. More than a year ago, I re-requested her to observe all the facts she could with reference to self-abuse, and especially to note the relative proportion among the boys and girls, the ages at which the habit is contracted and whether, according to all the facts she could get, it is from example or self-formed. After more than a year's careful inquiry, I received the following report from her, within the present week: "About two-thirds of the children, girls and boys, in the same proportion, show evidence of practising, in some way, or attempting to practise self-abuse. The only difference I notice among them is that the girls seem to begin one or two years earlier than the boys. We find it in the boys from about ten—seldom earlier; while girls are detected in efforts to excite the sexual feeling at eight or nine years of age. I have made diligent inquiries of the parents of the children, as they were brought in, and have observed myself and had the nurses under me on the watch, and I believe that very few of these feeble-minded children are taught the habit by precept or example. It seems to be in them; they take it up of themselves." I have been told by many women addicted to this habit that they were neither taught it nor, in some instances, were aware that any one else ever practised it besides themselves. This is especially true among the more refined women. In the case of idiots, repressive influences are nearly eliminated, so that natural desire must be considered responsible for the facts. And, as we have seen, at least in the instance cited, if there is any difference in the results of natural desire, it points to girls as having the larger amount. And, all through life, corresponding facts are open to the observation of all, which go to show that the generative instinct is stronger in women than in men. For instance, it is undeniable that girls and women think and talk about boys and men much more than boys and men think and talk about the other sex. In very few women are there any important acts of their lives which do not relate, in one way or another, to their relations with the opposite sex. If this be true, it is inconsistent

with the theory, expressed by some, that women are less under the influence of their generative function than men. And this, notwithstanding the efforts made, among civilized women, to repress the sexual feeling. The very fact that it is considered necessary to surround women, everywhere, with a double wall of protection, proves the necessity for it. From the earliest age, every influence is brought to bear to hedge in women from the chances of their sexual function: religious, moral, educational, general law, and social ethics. Social ethics require, in most civilized countries, practical seclusion from opportunity, out of marriage, to exercise the sexual function. There must be the need of such ethics, in a strong natural proclivity, or the rule would not exist. I am aware that it is claimed that women would be continent if it were not for men. In a sense, this is true, of course. But the implication that women have to be shut up, to prevent men from ruining them, is not true as a matter of fact. Of course, I am not considering a question of morals, in their relation to social science. My present object is to ascertain what the facts are. Given the facts, and the morals will adjust themselves to correspond. For many years, I have occupied a good deal of time and have used all the opportunities which came in my way, both by personal investigation and inquiry of those whose opinions seemed entitled to consideration, and I have found my views to be completely changed from what they were several years ago. Of fallen women, there is not one in ten, according to my belief, who did not deliberately walk into temptation. Where there is one girl seduced by promises of marriage, there are twenty who are impelled by an internal influence which she prefers not to resist. It is an election of what seems to her at the time to be the least to bear. I am not considering the right and the wrong of this matter, but I use the evidence, as I find it, towards elucidating the subject under consideration. And the evidence coming from every direction goes to prove that the generative feeling is stronger in women than the average sentiment accredits them with. I may be asked here, How, then, does the belief obtain that the sexual desire is feeble in women? The fact is, that civilized women live in an atmosphere, at once false, strained, and unnatural so far as relates to their sexual life. And their bodily health and mental processes are injuriously affected by the strain to which they are subjected. In the first place, the belief of

many that erotic sensations in women are immoral, degrading, and to be suppressed by all the powers of will, works in two directions: In the majority of cases it diminishes the natural sexual sense; in a certain number it practically destroys it, and in others the very effort to overcome, by directing the attention to the subject, stimulates and increases the feeling, sometimes inordinately. The result is, that few women are natural in their sexual lives. In one way or another, by diminution, excess, or perversion, most civilized women are ill-regulated sexually. We can easily account for the loss of sexual repose, through adverse mental state, by comparison with the effect of an adverse sentiment in reference to any other natural appetite. The individual belief, no matter how acquired, goes far in determining the related appetites of the individual. I was told by an English gentleman who had lived many years in India, that during a famine in that country, he was called to see a native who had sunk at his gate from starvation. When this gentleman sent his servant with food to the starving man, he refused to taste it because he feared it might have been prepared in an unconsecrated place. His religious belief, that food cooked where bullock's flesh had been prepared, was unclean, so affected his appetite that even the pangs of starvation were not sufficient to overcome his repugnance. The fact that we lose desire for an article of diet which we believe to be objectionable, though we may have had a strong liking for it previously, is well known. I have seen it illustrated in many patients, and it is notably so in a class of people not now so numerous as formerly, called Grahamites or vegetarians. In fact, when a young man, I myself tried the experiment, and during several years I never tasted flesh. When I began the eating of flesh again, I found that I had lost all relish for it, and it required more than a year to re-establish a liking for it.

And yet the number of women who, under the influence of adverse sentiments, actually suppress the sexual feeling, is much smaller than is generally supposed. There is no doubt that when the repression is complete, there is a general lowering of the vital tone and corresponding inadequacy in every other function. The adult system, when impotent, loses a tonic element, without which there can never be the most vigorous health of body or mind. But, as I have already said, the sexual feeling exists in women much more largely than

is commonly believed, though its presence is masked by a great variety of circumstances. Chief among these is the perversion of feeling, from the directly erotic to those which have their origin in the erotic sense, but find expression in feelings which, being perverted, are not recognized as sexual. Whatever feeling is especially emotional is liable to be the outlet of suppressed erotic feeling. Hence the common disposition to cultivate esthetic sentiments, to the exclusion of almost everything of an intellectual or practical nature, among so many women; music, the love of the drama, attempts at painting, affectations in ceramics, and the fine arts generally, and especially the absorbing attention in the article of dress. This is a consequence of suppressed sexuality. And let me say, in passing, the exclusive cultivation of esthetics, by intensifying feeling in general, increases the liability of the sexual feeling to become intense, along with other emotions. For one emotion is readily convertible into another, especially when a person is undisciplined in his mental processes. For instance, it was claimed, in a celebrated case which we all remember, that the lady was seduced while her feelings were still tender from a recent loss of a child.

Recurring to the question of the masking of the sexual feeling under other manifestations in which the sexual is non-recognizable, I will say that a great many women manage to keep themselves, often without knowing it, in a kind of semi-erotic state. It is a condition seldom reaching an orgasm, not usually recognized as sexual, but really such, and exerting a powerful influence over a woman's habits, thoughts, and daily life. In my opinion, this partly repressed, partly excited, long-drawn-out, never culminating, never wholly subsiding intensity of feeling is the greatest evil of modern society. It is this state of things among young women to which I desire most earnestly to call your attention. The worst of it is that women themselves are often wholly ignorant of the nature and origin of their feelings. A woman intends to be perfectly truthful in denying, perhaps resenting, the suggestion that her feelings originate in her generative function, and that she unconsciously cultivates this peculiar condition of her feelings. But such is very frequently the case among the most refined and cultivated women. Intensely emotional, they manage to keep their feelings wrought up to a certain pitch of exaltation, into which the erotic element enters as the largest factor. This is proved by the frequency

with which the true condition of their emotions is revealed, not only to the observant physician, but often to themselves also. It is often a great surprise to them. A disposition to introversion, self-inspection, "watching themselves live," as the French say, measuring everything by its relations directly to themselves, are characteristics of a perverted generative desire. Languor, indisposition to exertion, a great variety of pains and unpleasant sensations, irregularities of the various functions, are among the characteristic results on the health of the perverted and masked sexual feeling. In marriage, they are only conscious of a diffused glow of affection, but are imperfectly aware of true desire. Their minds, given up to and occupied exclusively by external things, do not comprehend localized desire and culmination in orgasm of the sexual relation, and so they receive little satisfaction, as wives, and give less. Dispersion of the sexual sense destroys local desire. It can be restored by attention to the conditions of its manifestation. Hence, the difficulties which so frequently occur in married life, and which seem to some so unaccountable.

And, lastly, there are those cases—and they are not a few—in whom the effort of repressing the erotic feeling has had the effect contrary to that which was intended. A strong feeling sometimes rebels against annihilation, and the very effort for its suppression so fixes attention on the thing to be put down that it is directly excited to increased activity. I have found that girls, with cold, calculating mothers, are often greatly excited, by the persistent effort to throw discredit on men in general and the sexual relation in particular. Some of the worst cases I have ever seen of uncontrollable desire, have been in girls, having had their feelings stimulated to an inordinate degree by conversation which was intended to produce the opposite effect. Not to dwell too long on these preliminary points, the general result of all these various forms of imperfect sexual hygiene is general perturbation of the generative function in modern women, and the consequent loss of that tranquillity without which no woman can live a strictly healthful life. The effect on the mind in producing instability of purpose, is quite as unfortunate as on the bodily health and vigor.

Beginning with the last-named class of cases—viz., those in whom the erotic feeling has been excited beyond the normal

average—I will illustrate the subject by a number of cases in point:

A young lady of twenty-four was brought to me, some years ago, for loss of power in the lower extremities. She had been confined to the bed for six years. There was no paralysis, as she could walk well enough when she made sufficient effort, which was always done when we commanded her to do so; but the moment we left the room, she would relapse into the bed and into a kind of a dreamy mental state, which soon attracted my attention. Failing to discover any physical disorder, the real cause of her habitual languor became the subject of earnest inquiry. At first, masturbation was suggested. But the most searching and careful investigation satisfied me that she was addicted to no such habit in any of its many forms. In fact, she not only did not know that there was such a habit, but, strange as it may seem, she was not aware that she even possessed sexual organs. She was a plain girl, of good sense, but brought up in a small country village, where she had never had suggestive opportunities, as country girls often have, but, in the absence of direct instruction, she was as ignorant of the generative function as a babe. Her history was, briefly, this: When she was about thirteen years old, on occasion of sickness in the family, it became necessary for her to sleep with her little niece, in the bed where her brother and his wife had been accustomed to sleep. Now, it so happened that, a few days before, she had overheard a neighborhood gossip remark that some women would become pregnant by sleeping in a room where a man's pantaloons were hanging. Utterly ignorant of a single fact relating to generation, she went to bed in fear and trembling. After lying awake all night in anxiety of mind, she got up next morning with a load on her mind and a great fear in her heart. For months she watched herself for evidences of pregnancy. Finally, menstruation came to add dismay to her disturbed mind, but no positive knowledge was given her to clear up the mystery and relieve her apprehensions. The event proved that these simple and almost absurd circumstances were enough to keep her attention fixed on subjects relating to sexual phenomena, with the effect of stimulating to an enormous degree the sexual feeling. At seventeen, she was a confirmed invalid, and when she was brought to us at twenty-four, she had been bed-ridden six years. She was so erotic, that a cat rubbing against her, as she lay on the lounge, had been known to produce an orgasm. The vulva and vagina were deep colored from congestion. And yet she was wholly unaware of the sexual nature of her feelings; had no idea that personal contact of the sexes was necessary for conception, and was utterly confounded when the sexual organs and relations were explained to her. But this did not prevent her from having become overwhelmingly erotic, without giving that feeling any intentional aid, and without the thought of the sexual act having once entered her mind. The

little circumstance which I have related was sufficient to keep her mind in such a frame as to stimulate the sexual feeling, with the result of ultimately subordinating all other functions to its influence. This case was beyond hope, and is calculated to excite infinite pity in right-minded persons.

I may here remark that loss of power, especially in the lower extremities, is a common effect of excessive erotic feeling. I have seen many cases of the kind. It sometimes happens that girls approaching womanhood are so affected. In the latter case, it generally is but partial, and they regain the use of their powers of locomotion soon after menstruation is established. But when the locomotion is affected by erotic influence, after the establishment of the catamenia, I have found it much more difficult to cure. In fact, it generally cannot be cured except by marriage or a course of instruction and discipline.

Another young lady, also twenty-four years old, was brought to me with diminished power in the lower extremities, and a history varying from that of the case just related, in that she was a lady of culture, and was perfectly conscious of the nature of her feelings, though she did not connect them with her muscular inability. She had been bed-ridden from fourteen to eighteen, and since that time had been led about a good deal of the time. At times, she could walk alone. I cannot describe the method, but the walking was peculiar and characteristic of the erotic disturbance. A disturbance of the reflexes is the best explanation I can give. Sexual feeling was increased with her growth until its influence had become overwhelming. She was highly nervous, excessively conceited and jealous, and very apt to fall in love. In fact, she told me that the sight of a fine-looking man had excited her to involuntary orgasm in a public conveyance. On such occasions she would be exhausted for days afterwards. She was intelligent, and recognized the nature of her troubles, but was incapable of controlling them for any great length of time. I advised marriage in this case, which, having good opportunities, she has embraced with entire success.

One of the most pitiable cases I have met was that of a girl who was dwarfed and deformed by disease of the spine. Ovulation was retarded, and she did not menstruate until she was about twenty years old. A year or two later, she began to act very strangely. Though naturally sweet-tempered, she now became unreasonable and peculiar. At last, she became angered at her mother (whose favorite she had been), because she fancied this mother was preventing a certain young man, whom she believed to be in love with her, from coming to her. As tending to show how entirely beyond voluntary control the sentiment was, I will state that she had never seen the young man since he was a little child ten years before. With the development of her

sexual functions, undisciplined as her mind was, her feelings took the only form of expression which presented itself to her imagination—the image of the little boy she remembered meeting ten years before. The case was hopeless from the start, as, with her untrained intellect, she was powerless to cope with feelings so absorbing. Rational on all other subjects, she was beyond reason in relation to this paramount influence. The functions were disturbed, menstruation ceased, her complexion changed to a leaden hue, and, for a couple of years, she was constantly attended by a companion, to prevent her from stealing out and trying to find her ideal lover. After a time, her system became more tolerant of the disturbing element, and she regained considerable composure, when she suddenly died, worn out, I have no doubt, by the constant strain on her nervous system for want of sexual repose. And yet there was good reason to believe that she was wholly unconscious of the nature of the feelings which possessed her, and never formed a definite sexual idea in her life.

A girl just coming into womanhood may be the most bewildered by the new, strange, and inexplicable feelings. And, if any man is unprincipled enough to take advantage of her ignorance and inexperience, there is no doubt that such a woman is more liable to be overcome by a feeling she is not accustomed to master, and to take a wrong step. But it is much later in life when unmarried women experience the greatest discomfort. I do not think that many women, tenderly reared, educated, and refined, and who are not under the necessity of pursuing some occupation which requires physical effort, reach thirty years of age without suffering more or less in one way or another from the disturbing influence of unoccupied generative function. From twenty-eight to thirty-six is the time when unmarried women suffer most. Sometimes they are aware of the nature of the disquieting influences. More commonly, though they may know it as a fact which, to them, is wholly isolated, they never regard feelings which they have been accustomed to look upon with dread and shame, as being connected with their bodily and mental health. They may not be even aware of their nature. And thus it is frequently very difficult to get at the real facts of the case.

There was a case illustrating the above statement, in a lady of thirty-seven, whom I had known for twenty years. She was one of the brightest and happiest of girls, living at home with every comfort which could be desired. She was neither too fond of nor too indifferent to gentlemen's society, and was, on the whole, as well-balanced a young lady as we often meet. She had had sev-

eral good offers of marriage, which she declined because she deliberately preferred to live at home. Time passed, and she arrived at thirty-seven years of age, when she came to me one day in a state of utter depression of spirits. She had lived from time to time in my family, and I knew her intimately. Careful inquiry revealed nothing referable to an erotic state, and I concluded that this was a case where, in arriving at an opinion, the sexual element must be eliminated. But I made no progress with the case. The depression of spirits and the disturbance of some of the bodily functions continued unimproved. Having occasion to call Dr. Lewis Fisher in consultation, and knowing his tact in diagnosis, in the class of cases under discussion, I asked him to do his best, for I was certain that he would not find any erotic element in this case. But Dr. Fisher differed from me in opinion, and later developments demonstrated the correctness of his view. Without the least disposition to falsify, this lady had negatived every allusion to the sexual feeling, simply because she did not know that her feelings were of such a nature. But it was ascertained that within the last few months, she had been having new, strange, and, to her, unaccountable sensations, but which, under analysis, were easily recognized as erotic. She would have involuntary orgasms in the day-time, while sitting, and even while reading. Her dreams were of the same unpleasant nature, and, to make matters as bad as they could be, she suddenly found herself in love with the husband of her most intimate friend, the only reason seeming to be that she was thrown in his company at the moment of the erotic molimen. In short, she seemed to have suddenly lost power of will under the pressure of feelings which were so strange to her that she did not suspect their nature.

I will not occupy time in detailing the multitude of symptoms, mostly of an hyperesthetic nature, which arise out of the long-continued strain on waiting generative functions. Bed-ridden women are generally erotic in some of its expressions. I have many histories of nightly struggles with desire, sometimes, and not always successfully, against self-abuse. More often, in my opinion, the patient does not realize the true nature of feelings which she does not allow herself even to think of, much less to dispassionately analyze. I wish to avoid what may be called exceptional cases and to present only such as have their congeners in every-day life: to show, in fact, simply what may happen, by showing what does happen.

The following case, which resembles a large class, differing only in degree, may serve to open our eyes to phenomena going on all around us.

While spending my vacation in New Hampshire, a few years ago, I was called to see a woman of fifty-four who had been bed-

ridden nine years and a down-going invalid since she was thirteen. She was supposed to have the usual variety of diseases, but so-called "spinal irritation" was the main source of anxiety; and this was her history: There was nothing to be remarked during her childhood except perhaps a little more emotional activity than the average girl of the neighborhood. With the establishment of ovulation, came a tendency to nervous prostration which was denominated "delicate health." As time passed, she withdrew more and more from active family occupations and would do the fine sewing and embroidery, take music lessons, and in general, attend to whatever required taste and feeling rather than muscular effort. Finally, she was recognized as the "invalid" of the family. She said she would have strange feelings and longings which she could neither understand nor explain. This continued until she was thirty-one years old. At this time she paid a visit to a relative, a physician, living in another part of the state. Him she consulted. Recognizing that the feelings she described to him grew out of suspended generative function, he accused her of masturbation. This she denied, not knowing what it was; but afterwards she related the interview to the doctor's wife, and asked her what he meant. Being informed (without proper caution) she tried it; and, as she thought, found relief from the terrible nervous strain she had so long endured. Subsequently she ascertained the evil effects of the habit and ceased its practice, as she averred, but without any sensible change in her health. Even at the advanced age of fifty-four, there was evidence of the controlling influence of the erotic sense.

Now here was a case, having an accession of erotic feeling sufficiently strong to subordinate general nervous phenomena to its influence, with the usual result of chronic invalidism; going on, from year to year, undiscovered by either physician or patient, until at thirty-one she accidentally discovers its sexual nature. And so she passed her life away, the innocent victim of ignorance of the laws of human nature. The fact that there was a period of self-abuse, from thirty-one to thirty-five or six, is interesting as proving the preparation for it through natural causes. It must be kept in mind that the masturbation was a result and not a cause.

And right here I will remark that, in my experience, self-abuse often begins at a relatively advanced age, in a great number of women. When a woman, with the erotic temperament, and generative function in abeyance, takes to her bed, no matter at what age, she often begins to masturbate, even if she has never practised it before. Such cases do not carry it to the desperate degree that those, beginning in youth, are apt to do;

they are shy about it and it is not easy to get the facts. But I have been able to develop the fact of self-abuse in so many of this class of cases that I think I have some right in believing in its frequent practice, among the bed-ridden, whether I take the pains to demonstrate its existence or not. Nevertheless, I hold that it is a mistake to consider the fact of masturbation, when proven, to be the cause, though unquestionably it is an aggravation of the invalidism. It is the strain on the nervous system of the unemployed generative function, which is most frequently the primary cause of the nervous prostration. The case is not much different, with or without self-abuse, except in degree. In either case, there is a protean brood of ailments, real and fancied, the hyperesthetics taking the first place. And, as the last quoted case demonstrates, masturbation is not necessary to the production of the invalidism, in this class of cases. But where there is one bed-ridden case, resulting from the strain on the generative function, there are a score of women about their ordinary duties, suffering from the same cause, only in a less conspicuous manner. This latter class deserves to be better understood, and should have the sympathy of every right-minded person, and especially of physicians. Physicians can understand, better than any one else can, the purely subjective nature of the erotic molimen. And every woman should be taught to feel that, in such an exigency, she will always be sure of kindness, sympathy, and good advice from her family doctor. Another illustrative case will suffice :

Being in the central part of the State, I was consulted by an unmarried lady of thirty-six, for what was supposed to be progressive paralysis of the lower extremities. She had been gradually losing the use of her lower limbs for six or eight years. It had increased until she could only go about the house, and had not attempted to walk alone in the street for a year or two. She walked staggeringly, but complained of nothing except languor.

Now there is a peculiarity in the manner of locomotion which distinguishes between loss of power from high nervous tension produced by sexual hunger and true paralysis. In the former case, the mental participation is readily detected by any one accustomed to see these cases. There seems to be a disarrangement of the reflexes, requiring more than ordinary volition for movements. But the mind being engaged by emotions, volition is curtailed. When once observed this peculiarity is not easily mistaken for

true paralysis. At least this is my explanation which I put forth for what it may be worth. We see the same phenomenon in some cases of phimosis, and I think the same explanation will apply in both cases. After sufficient examination, I frankly told this lady the nature of her case—that the paralysis was only apparent—when she gave me, without any hesitation, the following history :

Her general health was always good, so far as the ordinary functions were concerned, and what appeared to be a loss of power in her lower extremities, gradually increasing during the past few years, was the only thing of which she complained. As a young girl, she remembered recognizing the sexual feeling, but it had not been beyond control, until she was over thirty. She was utterly ignorant of the generative function and organs, and her curiosity was excited to a high degree, causing her to dwell on the subject a great deal of the time. It so happened that she had never seen the external organs of even a babe, and the crude and imperfect knowledge possessed by the plainest folk, had wholly escaped her. The result was a most intense curiosity; and this had much to do in producing the most passionate woman, except one, whom I have ever met. There was no error of conduct which I could detect; no self-abuse of any form; nothing, in short, but the preponderating influence of highly excited reproductive functions, craving employment, and acting as a disturbing element in her organism. It may be interesting for me to state that I proved the absence of paralysis by making her walk briskly all over town within a few days, by simply getting her mind interested in objects outside of herself.

I am aware that there is another side to this question. But freely admitting the injury of excessive indulgence, among many married persons, that fact only proves that the generative function cannot be trifled with—which is the position taken in this paper.

I have already said enough to arrive at the conclusion that the sexual function will not allow itself to be ignored. It is not a matter of indifference whether a woman live a single or a married life. On the contrary, as many women cannot marry and others ought not to marry, how women can live in health and comfort, while avoiding the pains and perils of married life, is a matter of deep concern and should engage the earnest thought of all who are interested in the well-being of the race. That the normal condition of a woman is to be married and be the mother of children, there can be no doubt. And there can be no doubt, also, that she is liable to severe nervous strain when her genera-

tive organs are not employed. I do not, for one moment, wish to be understood as believing that an unmarried woman cannot exist in perfect health, for I know she can. But the point is, that *she must take pains for it*. She must, in fact, work for it. The sooner women come to know that it is not all one whether they marry or not, the sooner will they begin to adjust their lives to the necessities which Nature places on them. And the first truth to learn is this, that the use of the generative function is a physiological demand. It follows that, when the organs provided for reproduction are not employed, some other demand for the suspended energies, which shall effect a vicarious relief to the unemployed functions, must be established. Accumulated force must find an outlet, or disturbance first and weakness ultimately results.

And this outlet we find perfectly effective in well-exercised muscles. If an unmarried woman desires to escape from the perturbing influence of unused generative organs, she must vigorously use her muscles. There is nothing, in my opinion, which is equal to daily use of the muscles to actual weariness, as an equipoise of the generative demands. And I am confident that a good degree of muscular effort, daily resorted to, will be perfectly effectual in saving unmarried women from a multitude of evils to which their present modes of life subject them. But it must be real muscular action, and not vain excuses for it. And the value of muscular action, as a relief to an overladen nervous system, implies more interest in practical matters and the avoidance of much of those esthetic and emotion-producing occupations which seem to be about the only things that civilized women most do crave. The evil mental influences begin in childhood, in the constant stimulation of the emotions, in society and in domestic life, as well as in most of the methods of education for girls. Let education be more practical, and not carried beyond a girl's physical and mental capacity. And let things be learned for their own sake, and not merely as a means of exciting some form of emotion. And, above all, let women know more about themselves; let the generative function be no longer a sealed book to them, but let them be taught everything interesting and necessary for an intelligent person to know. In a word, KNOWLEDGE and LABOR are the twin remedies for neutralizing the evils connected with the health of single women in civilization,

and there is nothing which, rightly known, is not modest, elevating, and promotive of virtue. When the day arrives when women shall understand the requirements of all their functions, so that they will know how to adjust themselves to whatever situation in life they may be placed in, and, when unmarried women, young or middle-aged, shall clearly see that to be well in body and mind they must do something, day by day and every day, that is in the nature of effective bodily effort as a counterpoise to sexual inaction, they will be healthy and strong. And then, and not till then can it be truthfully said that civilization is not hard on women. May Heaven speed the day!

A CASE OF OVARIAN POLYCYST, INTERESTING DIAGNOSTICALLY ON ACCOUNT OF THE SCARCITY OF CELLULAR ELEMENTS IN ITS CONTENTS.

BY

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M. H., æt. 51, is married, and has had three children at term and one miscarriage, the last pregnancy occurring fifteen years ago.

About ten years since, when the menopause occurred, she thought she was again pregnant, because the menses were suppressed and the abdomen and mammae increased in size, but more especially, as she avers, because she felt the movements of the child. In the mean time, she became quite fat, and enjoyed good health apparently, with the exception of the agitation which the supposed fetal movements caused her, and which she declares have never ceased. About three or four months before I first saw her, the abdomen began to distend quite rapidly, and she lost flesh apace.

On August 5th, 1881, by the kindness of Dr. Jno. R. Haney, of Camden, I saw the patient with him, when she presented the following condition: She was somewhat emaciated, and suffered from dyspnea. The abdomen was greatly distended by what appeared to be an encysted fluid. As the patient lay upon the back, the abdomen projected as much or more than when she was erect. Its surface was perfectly smooth and symmetrical, and gave a measurement around the entire body, at the umbilicus, of fifty-two inches. The lower ribs were pushed out, and the ensiform cartilage projected forwards. Percussion elicited dullness over the entire anterior and lateral surfaces of the flanks,

where marked resonance was observed, with a slightly resonant sound in the epigastrium and along the borders of the lower ribs. Change of position did not change percussion results. Palpation gave perfect fluctuation all over the dull surface. The uterus was slightly prolapsed and anteverted, and its cavity measured three inches. The abdomen was so filled by the tumor that the uterus could not be moved, nor could the tumor be moved so as to act on the sound, placed in the uterine cavity. This immobility might have been due to adhesions. The tumor could be touched by carrying the finger high up in the vagina. The right leg was edematous. There was no evidence of disease of the thoracic or abdominal organs.

A diagnosis of ovarian cystic disease was made, and, from the symmetry of the abdomen, and the perfect fluctuation elicited throughout the tumor, it was thought to be a mono- or oligocyst, though the history of the rapid development and loss of flesh pointed rather to polycyst.

Two days later, August 7th, I removed, by aspiration, nearly six gallons of a thin, straw-colored fluid. After the cyst had been evacuated, a large, irregular, and apparently solid mass could be very plainly felt in the right iliac region, extending across to the left, where it was much smaller. The case was now thought to be almost certainly a cyst of the ovary (probably the right), and of polycystic variety, though the fluid indicated rather mono- or oligocyst. A portion of this fluid was submitted to Dr. H. F. Formad for examination, and he reported as follows.

PHILADELPHIA, Aug. 10th, 1881.

Dr. B. F. Baer.

DEAR DOCTOR:—Careful examination of the fluid which you handed me, labelled M. H., revealed the following: In appearance and consistency, it resembled in every respect ascitic fluid. It contained a considerable quantity of albumen or mucin; both these substances are known to respond equally to the same tests. Under the microscope, it showed to be extremely poor in cellular elements of any kind. A few red blood-corpuscles and a few pus-corpuscles were seen, and also very few of the so-called "ovarian cells," but not enough of the latter to call the fluid an ovarian one. In my experience, only a large number of these "ovarian cells" in a fluid would make it safe to pronounce it "ovarian." A limited amount or quantity of the cells in question is found even in an ascitic fluid. Very truly yours,

H. F. FORMAD.

On October 14th, nine weeks after tapping, I again saw the patient, when the abdomen was found to be as large, if not larger than when aspirated. It was again symmetrical and smooth on its surface, but fluctuation was not quite so marked as before.

Operation was now advised, and, on October 20th, ovariectomy

was successfully performed upon her by Prof. Wm. Goodell, at the Hospital of the University of Pennsylvania, assisted by the writer, and in the presence of a section of the graduating class (thirty gentlemen). It was found to be the right ovary which was diseased, the left being in a healthy condition of senile atrophy.

The variety of tumor, and the character of the fluid furnished by it, I thought to be of sufficient interest, diagnostically, to warrant me in bringing it before the profession. The tumor was multilocular, made up of one large parent-cyst with hundreds of secondary or child-cysts of endogenous growth and of varying sizes.

We have here a case which presented the history and physical signs of ovarian cystoma, one in which it was not necessary to invoke the aid of a chemical and microscopical examination of the fluid to reach a correct diagnosis; and yet, when the fluid was carefully examined, the result, as we have heard, was such as to throw a serious obstacle in the way of one who believed in the pathognomonic value of the "ovarian granular cell." Whether a fluid so poor in the special cellular element under discussion, as this was, would be pronounced pathognomonic of cystic disease of the ovary by the discoverer of this cell, or not, I do not know, but from the following, which I quote from his paper read before the American Medical Association, in 1873, I should infer that he would so pronounce it. "This cell, when found in this location, I believe to be pathognomonic of ovarian disease, and, as such, its diagnostic value cannot be over-estimated."

The word cell is here used in the singular, and the inference is, that where a single cell is found which responds to the tests necessary to designate it the "ovarian cell," he would pronounce it pathognomonic of ovarian disease. If it cannot be so regarded, except where the cells are found in large numbers, of what diagnostic value was this cell in the case I am now reporting, in which the cells were so scarce that a competent observer reports that he has seen as many in the fluid of peritoneal dropsy, and who was so firm a believer in the diagnostic value of the cell, when found in large numbers, that he at once expressed strong doubts of the fluid being the product of ovarian disease?

It is true that the poverty of the fluid in this special case strengthens the position of the discoverer of the cell, and, if it

can always be relied upon as positively diagnostic, where only a very few cells are found, and the cell can always be found in the fluid of ovarian cystoma, then the value of the discovery, in truth, cannot be over-estimated. But how can it be so regarded when fluids, other than ovarian, found in this locality, contain the same cell in larger numbers than was found in the fluid of this polycyst—a variety usually rich in cellular elements. Barnes, "Diseases of Women," page 371-2, says: "Chemical and microscopical analysis might be expected to reveal the source whence these fluids come. And undoubtedly the chemical and microscopical features of fluids from ascitic collections, ovarian cysts, cysto-fibromas, renal and hepatic cysts offer characteristic differences. Sometimes, perhaps most frequently, trustworthy evidence may be thus obtained. But, in others, and these may be the most critical, where ordinary methods give only doubtful evidence, and where, consequently, we should most anxiously seek for assistance, this method has led to disappointment or error. This happened on one occasion to myself. I submitted some fluid to a gentleman justly considered an authority on this special point. Acting on his report, I opened the abdomen, expecting to find an ovarian cyst; the actual thing was an encysted peritoneal dropsy. Dr. Fordyce Barker informs me that the 'characteristic ovarian cell' was found in the sac of an extrauterine gestation, recently operated upon in New York."

Can the cell always be found in the fluid of an ovarian cyst? Emmet, "Prin. and Prac. of Gynecology," page 797, says: "But unfortunately, in certain cases where the condition may leave the most expert observer in doubt as to the true character of the tumor, this corpuscle is sometimes not found by the microscope. In two instances of doubt, it has occurred to me to operate and remove ovarian tumors after experts were unable, from an examination of the fluid, to give me the slightest information in regard to the character of the tumor."

Here are three instances in which the aid of the microscope was sought to clear up an obscurity, with the result of leading to the error of opening the abdomen, to find that the supposed tumor did not exist in the one case, and, in the other two, although the tumors did exist, an expert could not find the so-called characteristic cell.

If, in the case here presented, dependence had been placed

upon the character of the fluid, I should have doubted the correctness of the diagnosis, made from the history, symptoms, and the physical signs presented by the case, and should have tapped again unnecessarily, and probably much to the detriment of the patient, for there is certainly some danger in tapping a polycyst, from hemorrhage and inflammation, either of which might result in death, or, at least, in serious complications, as from adhesions, etc. Peaslee "once lost a patient within forty-eight hours after tapping a *monocyst*, apparently from mere shock." (Ovarian Tumors, page 175.)

There is no doubt that the fluid, considered as a whole, is often of great value as an aid to diagnosis in obscure cases, but the time does not seem to have yet arrived when a certain element of it can be relied upon as pathognomonic of ovarian disease.

REMARKS ON EXTIRPATION OF THE UTERUS.

BY

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and

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DURING the last few years, several important operative proceedings have been proposed and carried out upon the pregnant and non-pregnant uterus. In the following remarks, we propose to discuss some of the surgical and anatomical advantages and disadvantages of these operations.

A few years since, Professor Porro, of Pavia, after having performed the first steps of the ordinary operation for Cesarean section, and extracted the child through the uterine wound, proceeded to remove the uterus, together with the ovaries, by amputation through the cervix. The object of this was: firstly, to do away with the necessity of leaving an incised uterus, liable to be the source of hemorrhage, in the abdominal cavity, and secondly, to prevent the possibility of future pregnancies recurring in a patient presumably the subject of such deformity of the pelvis as to render delivery,

except by the Cesarean section, impossible, and thus obviate the necessity of again submitting the patient to such a dangerous operation.

Extirpation of the unimpregnated uterus may be either partial, as in the case of amputation through the cervix for the removal of uterine myomata, or entire, as in the operation suggested by Freund, of Strassburg, in which the whole of the uterus is excised.

Freund's operation consists in the removal of the entire uterus by dissecting the anterior surface of the cervix from the posterior wall of the bladder, dividing the broad ligament on each side of the uterus, as well as the peritoneum behind the cervix which connects it with the rectum, and then uniting the cut edges of peritoneum by means of sutures, and so reclosing the peritoneal cavity. This is a most severe and difficult operation. Before, however, entering into the details of this operation, it will, perhaps, be well to consider the normal topographical anatomy of the pelvic organs and their relations.

The fundus of the uterus is usually said to lie on a level with the plane of the inlet of the pelvis and the ovaries at a slightly lower level on each side of it. This position would certainly bring those organs within the reach of direct pressure made from the abdominal walls. In his atlas of topographical anatomy we find that Pirogoff figures a section of the body of a middle-aged multiparous woman with normal and healthy pelvic organs, in which the highest point of the fundus lies 4.5 centimetres below the plane of the pelvic inlet, and when the bladder is distended, it is pushed backwards and still lower downwards in the pelvis. This corresponds with our own observations on frozen sections and on the unfrozen cadaver. These are further confirmed by reference to a plate in Braune's Atlas of Topographical Anatomy, taken from a section of the body of a young woman aged twenty-five years, who died during pregnancy, in which the level of the summit of the fundus is 2.2 centimetres below the plane of the inlet at the end of the eighth week of pregnancy.

The fundus being so much below the inlet, the ovaries must be, if anything, still lower. This is seen in Pirogoff's plates,

and can be verified by examination of the pelvic organs in any normal subject.

In the female pelvis, the small intestine covers and is superincumbent upon the uterus, ovaries, and bladder. In fact, the small intestine is almost entirely contained, when empty, in the true and false pelvis, and remains there behind the cervix, lying in the hollow of the sacrum, when the pregnant uterus has risen out of the pelvis and occupies the chief part of the abdominal cavity. When, therefore, pressure is said to be applied to an ovary by means of the hand or a tourniquet placed over the brim of the pelvis pressing downwards, it is a long way from the ovary and separated from it by intervening coils of small intestine. Admitting, of course, the truth of the statement by Professor Charcot, that pressure so applied arrests and inhibits the occurrence of a hystero-epileptic attack, some other explanation must be sought for than that of pressure on the ovary, which is, indeed, quite beyond the reach of any pressure which can be applied through the abdominal wall.

The operation of Freund has been performed about eighty times on the continent, a few times in America, and we believe once in England. It is, as we have already stated, a very difficult one, and has been attended generally with unfavorable results.

In order to obtain some definite information in regard to the different steps of this operation, we have twice performed it upon the dead subject. After making the usual incision through the abdominal wall to within two centimetres of the symphysis pubis, we found the pelvis packed with coils of small intestine, nearly all of which had to be drawn up out of the pelvis and pushed upwards into the abdominal cavity and retained there till the operation was completed. This in itself constitutes one of the many difficult steps of the proceeding, and Professor Freund has devised a kind of net in which the intestines are caught and held up during the operation. Having thus raised the intestines, the glistening fundus of the uterus was seen deep down in the pelvis. On measuring the distance between the fundus thus seen, and the lower angle of the abdominal wound, it was found to be eleven centimetres, and in that situation was practically out of reach for operative purposes; so far down, indeed, as to be only capable of being reached by the tip of the middle finger. With the view of

ascertaining whether the uterus could not be raised to a higher plane in the pelvis by distending the rectum, we introduced into the rectum an India-rubber bag, or colpeurynter; this we distended with three hundred and sixty grammes of water. As the distention proceeded, the fundus of the uterus was seen gradually to rise upwards and forwards until within two centimetres of the lower angle of the abdominal wound. The fundus being then seized by a volsellum, the broad ligaments were divided on either side of the uterus and the anterior surface of the cervix uteri was dissected from the posterior wall of the bladder; behind, the fold of peritoneum between the rectum and the lower part of the cervix was divided. It was found necessary, in order to avoid wounding either the bladder or the rectum, to make flaps of peritoneum from the anterior as well as the posterior peritoneal covering of the cervix.

The dissection of the anterior surface of the cervix uteri from the wall of the bladder is a delicate and tedious proceeding, even on the dead subject. It is necessary that the contour of the bladder should be defined by the introduction into it of a bougie which keeps the vesical wall on the stretch during the dissection. The insertion of the vagina round the cervix is at last divided and the uterus removed.

It was by no means easy to tell exactly when the cervix was dissected down to the level of the os uteri, and where the vaginal wall should be divided. This would be still more difficult to see on the living subject with the parts obscured by blood. The finger of the assistant should be introduced into the vagina, and he should indicate with it the point of junction of the vagina with the cervix. The uterus having been removed, there remained the cut edges of the peritoneum between the bladder, rectum, and broad ligaments, to be united. This is best done by bringing the edges of the peritoneum together antero-posteriorly with catgut sutures. The abdominal cavity having been sponged out, the wound in the abdominal wall was brought together as in an ordinary laparotomy.

As regards the advantages which Porro's operation has to offer against those of the more ancient Cesarean section, we do not think that it has established a claim to precedence over the older operation. We shall not discuss the published statistics of the question. To our mind the statistics of these opera-

tions only prove the fact that some patients may undergo either operation and yet recover from it.

It is obviously true of both operations that all, if not nearly all of the successful cases are published. On the other hand, it is by no means certain that a corresponding proportion of the unsuccessful cases has been put on record.

The risks to the mother in the Cesarean section are chiefly those which arise from non-contraction of the uterus after the delivery of the child and placenta. Experience has shown that this is not very great, and that when contraction does not follow, the uterine wound is capable of being united by sutures, thus leaving the vagina as the only exit for sanguineous discharge from the internal surface of the uterus.

As against this eventuality the danger of severe hemorrhage from such an extensive division of structures as is involved by the amputation of the uterus through the cervix and the removal of the broad ligaments and ovaries, offers at least an equal chance of fatal hemorrhage, more especially as the vascularity of the implicated parts is enormously increased at the end of gestation.

Peritonitis may supervene and prove fatal, or the pedicle may suppurate and give rise to septicemia. Again, the discharges of irritating mucus and debris from the cervical canal may escape into the peritoneum and set up septic peritonitis. Another danger is the profound shock to the nervous centres, which is caused by the division of the cervix uteri. If the patient escapes the other dangers of the operation, she may succumb to shock.

In the operation of amputating the uterus through the cervix for the removal of fibro-myomata, shock is one of the greatest dangers to the patient. After the successful removal of an enlarged fibro-myomatous uterus, we have seen the patient die within two hours under the shock caused by dividing the cervix. Our experience on this point is corroborated by that of Dr. Savage, of Birmingham, who has seen death occur from the same cause, and who recognizes it as being the chief element of failure in this operation.

The operation of Freund might be justifiable in those cases where the body or fundus of the uterus was the seat of cancerous growth. As a matter of fact, cancer in either of these

situations is of extreme rarity, and when present can but seldom be diagnosed with any degree of certainty. The removal of the uterus by Freund's method in such cases may then fairly be set aside.

Freund's operation has, therefore, been advocated and practised more especially for the removal of cancerous growth of the cervix and its vaginal portion. It is just, however, in cases of cancer of the vaginal portion that the growth may be more readily removed through the vagina, especially as it is in the vaginal portion that the disease first commences. When the vaginal portion alone is implicated, we do not see the necessity for such a severe operation as Freund's for the removal of the growth.

If the disease has spread beyond the vaginal portion into the cervix, its anatomical relations with the posterior surface of the bladder render it extremely probable that the disease has spread into the tissues of the bladder. In this case, the case in which the operation is most commonly undertaken, the dissection of the diseased cervix from the bladder must necessarily be most difficult and, in all probability, involve the wounding of that organ, or at any rate the leaving behind in its walls a portion of the morbid structures.

The same argument applies to the connective tissue surrounding the remainder of the cervix and uniting it with the rectum behind. If, then, the operation is performed without wounding the rectum or bladder, and the patient recovers from the immediate effects of the operation, the chances are in favor of a recurrence of the growth with fatal results. The union of the divided edges of peritoneum would probably be impossible, because the sutures would have to be passed through portions of cancerous tissue left behind. Thus the closure of the peritoneum, which is one of the essential steps of the operation after the removal of the uterus, would be impossible. Ricord divides operations into three classes. In the first class, he places those severe operations which he feels himself justified in undertaking.

In the second class, he places those operations which he himself will not perform, but at which, nevertheless, he will assist.

In the third class, he places those operations which he himself will neither perform, assist at, nor witness.

Adopting this classification, would not the surgeon, whose spirit of enterprise is duly controlled by prudence, place this operation of Freund in the last category?

A CASE OF PUERPERAL CHOREA.

BY

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THE patient, 23 years of age, married, entered Maternity Hospital September 28th, 1881, in labor with her third child. She was anemic, and had lived in poverty with unhealthy surroundings, and had suffered ill-treatment from her husband. When first seen, she was afflicted with convulsive movements of the face, body, and both extremities, closely resembling those of chorea. The contortions were bilateral, and distributed over nearly all the voluntary muscles of the body. Her mind was quite clear, and she gave a history to the effect that for two months she had been suffering from spasms," which originally began in the right arm, and gradually extended and increased in severity. The attacks had been of much severer type since she fell down-stairs three or four days previous to her admission. During the whole time she had suffered greatly from insomnia. At 5 P.M. on the day of admission, she was safely delivered of a healthy female child, weighing nearly ten pounds, and, therefore, undoubtedly at full term. Chloroform was required to keep her in bed during labor, and subsequently her convulsions and contortions increased to such a degree that manual restraint became necessary. She was thoroughly conscious, and seemed afraid of being thought insane. She said she tried, but found it impossible to control her involuntary movements. Later in the evening, becoming still more violent, she was chloroformed, as neither morphia nor bromide of potash had any influence on her. She would sometimes sleep for an hour after the inhalation, but every slight noise, as even when a person sneezed, would arouse her to attacks as sudden as they were violent, rendering it almost impossible to keep her in bed until again chloroformed.

Early in the evening, morphia gr. $\frac{1}{4}$ was given hypodermically, and at 2 A.M., seven minims of Magendie. Pupils had been contracting during the night, and towards morning were very small. Breathing became very slow and deep, but not stertorous. At one time, the respiration was reduced to six per minute. The pulse, however, was rapid. There was no sweating noticeable. The patient still continued to be easily disturbed, and the con-

tortions, when awake, were but little diminished in severity, and the respirations were then increased. It was now much easier to keep her under anesthetic influence. Towards day-break chloral was used, also stimulants. Respiration slowly increased, and at 8.30 was fourteen per minute. Pupils still contracted, and reflex irritability greatly lessened. At 10 A.M., temperature, $100\frac{1}{2}$; pulse, 100; respiration, 20. During the day, the patient slept a good deal without chloroform, and in every respect seemed improved. Treatment: chloral, bromide, and whiskey. When disturbed she was very irritable, and would frown and grit her teeth. During the afternoon I first saw her, and, while her contortions certainly closely resembled those of chorea, a peculiar, wild, staring expression of the eyes, and the absence of reflex contortions on digital examination per vaginam and palpation, led me to doubt the accuracy of this diagnosis, and to suspect the possible inception of an attack of puerperal mania. At that time, the diagnosis vacillated between chorea, beginning puerperal mania, and hysteria. The subsequent course of the case showed the first diagnosis of chorea to be the correct one. The heart was found to be normal, and no albumen or excess of phosphates were found in the urine.

Sept. 30th.—Second day after delivery, patient was very quiet and hard to arouse, and it was impossible to get her to speak. Pupils were slightly larger than normal. Bromide, chloral, and stimulants still continued. Abdomen now very sensitive to pressure, but she passed a quiet night. In the morning, the patient seemed to be in a semi-comatose condition, with dilated pupils. It was impossible to rouse her to either speak or look, but, if irritation was continued, she would frown and grit her teeth, the same as was noticed the day before. Temperature, $103\frac{3}{4}^{\circ}$; pulse, 126; respiration, 36. Baths and stimulants ordered. All night she remained in the same condition, but would, at irregular intervals, give a sudden prolonged and very peculiar cry, and a few of the same chorea-formic motions would then be noticed. Her urine had to be drawn, but her bowels moved spontaneously. There was slight improvement the next day (Oct. 2d), and temperature a little above normal. Pulse somewhat rapid and weak. Oct. 3d.—She was more sensitive to disturbance, and showed more or less irritability, by frowning, etc., when interfered with. Convulsive movements were decidedly lessened. The patient could be aroused to take her medicine, and in all respects was greatly improved. The following morning, symptoms of acute mania were noticed. In the afternoon, she was transferred to one of the medical wards for further treatment, and came under the care of Dr. Thomas Gaunt, the house-surgeon in charge of the ward, to whom I am indebted for the faithful report of the case. She was then found to be suffering from acute mania of mild type and somewhat violent chorea. During the following week, she improved rapidly under tinct. hyoseyamus, which was at first given in full medicinal doses, and later increased, until the physiological effects

were produced. She received, in addition, opium, chloral hydrate, and bromide of potash.

The chorea began to improve before the mental symptoms became more favorable. At the end of the second week, she was entirely rational, and has continued so up to the present time. Slight but diminishing twitchings of the hands and feet continued for a short time; complete recovery gradually took place. Twenty-three days after delivery, began to menstruate. The child remains well.

Chorea during pregnancy is so rare a disease that no excuse is required for the report of an additional case. In 1874, Fehling could collect only sixty-eight cases, and Spiegelberg, in 1878, speaks of sixty-nine cases with twenty deaths. This large mortality was not due to the contortions themselves, but to the organic lesions in the brain, spinal cord, heart, kidneys, etc., which were found to exist in the fatal cases. Barnes, in a paper read before the London Obstetrical Society, in 1869, located the seat of the primary lesion in the corpora striata, which he claimed to be in a condition of partial fatty degeneration. This statement must as yet be considered unproved for the majority of cases. In 10 cases of Fehling's compilation, death was produced by cerebral complications (mania, eclampsia), and in 5 by heart disease. In 53 carefully recorded cases, 33 were primiparæ and 15 had the disease before puberty. Only in 29 cases did the pregnancy go on to term, and only in 3 cases did the chorea persist after delivery. In 39 out of 55 cases the chorea appeared in the first half of pregnancy. Fehling concludes that, in the uncomplicated cases which generally recovered, the chorea was due to reflex irritation from the sexual organs. The present case undoubtedly belongs in this category, although the contortions were at no time increased by local examination. The general anemia of the patient, her poor home influences, perhaps chiefly the abuse from her husband, that is mental anxiety, added to the hyperæsthetic influences of pregnancy, may well be considered sufficient causes for the chorea in this case. The mild dementia, occurring at intervals, indicates the implication of the brain to a slight extent. This case is exceptional in four respects: 1, The occurrence of the chorea in the latter half of pregnancy; 2, the completion of pregnancy; 3, the persistence

of the contortions after delivery; and 4, the recovery of the patient.

TWO CASES OF HYDROCELE IN THE FEMALE.

BY

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THE article of Dr. William C. Wile in the July, 1881, number of this JOURNAL has demonstrated the extreme rarity of hydrocele in the female, and the consequent paucity of our medical literature bearing on the subject. As I have been exceptionally favored in this particular, I will contribute my mite to the subject in the two following cases:

CASE I.—March 25th, 1876, I had occasion to examine the uterus of Mrs. J., æt. 24, of fine physique, the mother of one child. My note-book shows that I saw her four times afterward, within a month, on account of ante flexion and granular erosion of the neck of the uterus. She conceived soon afterward, and I saw no more of her until September 4th, when I was sent for to see her on account of a tumor at the left inguinal region, reaching down and occupying the greater portion of the labium majus. She stated that it first made its appearance two years previous, very soon after her confinement, and attained the size and shape of an almond, and remained so until a few weeks before my visit, when it began to grow, and was now for the first time beginning to give pain. During my previous examinations, there had been no mention of any such trouble, and it had escaped my observation. The tumor was found to be a pear-shaped body—*i. e.*, a slender pear with long neck—fully three inches in length, with thin walls and distinct fluctuation. At first, it seemed a hernia involving the bladder. The history of the case, however, after careful consideration, clearly precluded any such conclusion. It had at first been a small soft tumor, and remained unchanged by position or other circumstances for two years. It was in no degree reducible then. It could clearly be nothing else than an accumulation of fluid in the unobliterated canal of Nuck. As there was no rise in the temperature of the parts and no constitutional disturbance or enlargement of the lymphatic glands, the presumption was that it was not purulent. Feeling assured that it could not be a hernia, I plunged a bistoury into it. The fluid spurted out fully two feet, showing great distention that had evidently caused the pain. I was horrified by the claret color and strong ammoniacal odor of the fluid, which made me fear that, after all, I had cut into the bladder, which, following the sheath of the round ligament, had slipped down into

this position. A careful examination, however, reassured me, and the patient was left without further treatment. In a few weeks, the tumor began to refill. A few days before her confinement, which was on October 25th, the tumor was found to be about as large as at first. Under the circumstances, it was deemed best to open it with as little disturbance as possible. It was accordingly emptied with an aspirator. Three days afterward, she was delivered of a child weighing eleven pounds. January 20th, the tumor was as large as ever and painful. Half an hour after, having a full dose of morphine hypodermically, the cyst was punctured with a small trocar. When the fluid had all drained off, about two or three drachms of tincture of iodine was thrown in, and the parts well kneaded to insure contact of every part of the surface with the iodine. The tincture was then allowed to flow out through the canula. The operation was followed by great pain and considerable inflammation, necessitating the use of opiates for several days. Three months later, the tumor had returned; was painful and feverish. It was freely laid open with scissors; found to contain thin watery pus, and the surface carefully painted with nitric acid, the excess of acid neutralized with bicarb. soda; a pledget of lint (carbolyzed) placed in the most dependent portion of the wound, and a compress applied to keep the surfaces of the upper portion in contact. Her recovery was prompt and complete. In August, 1881, there had been no return.

CASE II.—Mrs. Y., æt. 34, mother of four children. At her last confinement, I was called to deliver her, and found a fluctuating tumor occupying the upper portion of the left labium majus and extending up the canal of Nuck, forming a soft body about two and a half inches long. As the labor had already entered the second stage, and the parts were well relaxed, it was deemed best not to interfere. The labor proceeded to a successful termination with no unusual features. The tumor remained stationary during her lying-in, but began to give trouble as soon as she commenced to go about. She stated that it had been first noticed just after the birth of her first child, and had increased in size very slowly until within the last few months. Since getting up from her last confinement, the growth had been very rapid, so that on February 10th, 1881 (two months after her confinement), the tumor had a body as large as a goose-egg, and was very painful. A trocar was plunged into it, and when the contents had drained away, three drachms of tr. iodine were injected through the canula. After thoroughly kneading it, the iodine was allowed to flow out. A pair of scissors was then entered through the opening left by the canula, and the lower portion laid freely open. A pledget of carbolyzed lint was introduced into the wound, and a compress applied firmly over the top. Considerable pain and some inflammation followed. The recovery was complete. September, 1881, there has been no return.

CORRESPONDENCE.

EXTIRPATION, IN ERROR, OF AN IMPREGNATED UTERUS, AT
SYDNEY, AUSTRALIA (*British Medical Journal* for August
27th, 1881).

REVIEWED BY

ROBERT P. HARRIS, M.D.,
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TO THE EDITOR OF THE AMERICAN JOURNAL OF OBSTETRICS.

IN the journal in question, this case is reported from the Sydney *Evening News* of June 3d, 4th, and 5th, 1881, under the heading of "An Unpremeditated Porro Operation," and may be stated in few words, as follows: The subject was a married woman of thirty-two, who first came under observation in December, 1880, and was believed by the physician consulted to be pregnant, and to have in addition an ovarian dropsy. In March, 1881, a second examiner pronounced her case to be pregnancy, but believed it to be of an abnormal character. She was finally sent as a patient to the Benevolent Asylum of Sidney, and came under the care of Dr. Warren, who examined her with a sound, which appeared to him to enter three and one-half inches into an empty uterus. His diagnosis was a tubo-ovarian pregnancy of about eight months' duration, and he decided to empty the cyst by laparotomy. Physicians were called in, the patient placed under anesthetics and carbolic spray, the abdomen and sac opened, and the fetus and placenta removed. Still unaccountably laboring under the impression that the fetal sac was abnormal, Dr. Warren ligated it with silk, secured two arteries, and cut away all the included mass, closing by dropping in the pedicle. The parts removed proved to be the uterus and its appendages, the ligature having been tied around the upper part of the vagina. Dr. Warren appears to have been still of the belief that the uterus was in some way abnormal until convinced of his error by an exhumation of the body and examination before the coroner, the woman having died of peritonitis on the second day.

The operation is said to have been performed with much

skill, and an abdominal drainage tube was inserted. "Dr. Warren stated that had he found his mistake directly after the removal of the fetus and placenta through the incision in the uterus, he decidedly should have acted, in fact, on Porro's principles."

The editor of the *British Medical Journal*, in commenting upon the case, says: "We trust that in future in suspected cases of extrauterine pregnancy, surgeons may not, through a preconceived opinion, fall into a similar error, and not find out their mistake until they have opened the uterus, and thus be forced to perform, as under the circumstances Dr. Warren rightly performed, an unpremeditated Porro operation."

In reviewing this case, we are forced to differ very decidedly from Dr. Warren in various points to be hereafter named, as also from the editor, in his remarks upon the necessity for removing the uterus in cases where the Cesarean operation may have been performed in mistake.

After his first error in diagnosis, Dr. Warren's second one was, in deciding to perform *primary* laparotomy, an operation the danger of which in extrauterine cases is gradually bringing it to be regarded as unjustifiable, except where the immediate peril of the patient, as indicated by very grave symptoms, appears to demand the taking of an extra risk. This was the case in the condition of the woman operated upon by Dr. Jessup, of Leeds. Fortunately for the doctor and his patient, there was no vascular cyst to be incised and afterward thrown off, and the placenta was not an element of danger, as it usually is where the operation is performed during the life of the fetus.

Dr. Warren's third error was his removal of the placenta from the cyst-wall. His practice, in view of the true nature of the sac, was perfectly correct; but it must be remembered that he still thought he was operating upon an extrauterine cyst. It is marvellous how blind to the truth one may become by the impress of a preconceived idea; the thickness of the cyst-wall, its muscular character, its contractile force, and the ready separation of the placenta, one would think should have at once convinced him that the fetus had been developed within the uterus. But no, his diagnosis was based upon a careful investigation, and must be correct.

His fourth error was in the removal of the uterus. It is true that this was done under a belief that he was ligating the pedicle of an extrauterine cyst; but we have his statement to the effect that, had he discovered before applying the ligature that he had performed a true Cesarean section, he would have completed the operation by the Porro method. And in this decision he is singularly sustained by the editor, whose language we have quoted.

We have now to consider this remarkable operation in its claims to the title "Porro," and as a proper or improper completion of a Cesarean section performed unwittingly upon a woman having a pelvis neither deformed nor obstructed. The operation, as performed by Dr. Warren, was not a true Porro-Cesarean one in the sense in which it was proposed and executed by the Pavian Professor, in that the uterus was not amputated through its cervix, and the pedicle fixed in the abdominal wound so as to be dressed externally. It is true that in Dr. Blundell's operations upon rabbits, the vagina was ligated as in the Warren case; but the pedicle was secured in the abdominal wound, and to this latter he attributed his success. It is known that several operators have dropped in the stump after ligating it, as a proposed improvement upon the method of Porro; but, as yet, all the women thus treated have died, showing that the dressing of the stump externally offers the most promising results. It is to be regretted that the method has failed in the hands of Professors Wasseige, of Liège; Veit, of Bonn; and Isaac E. Taylor, of New York, for it is certainly a much neater operation than with the *serre-nœud*, and if successful would avoid the tension of the pedicle upon the abdominal cicatrix. This form of treating the cervix appears thus far to be much better adapted to the non-impregnated than the impregnated uterus.

One exception, in a case hardly within the true Porro list, would appear to indicate a possible success in the method of Prof. Schroeder, as tried by Wasseige, in some future operation. The case referred to is that of Dr. Salin, of Stockholm, the points of which may be briefly stated as follows: . . . Woman, aged twenty-two years, pregnant fourteen months; uterus examined by sounding, gave a depth of two and a half inches; the organ appeared to be normal; was small, virginal, movable, and pushed over to the left side. The case was believed to be extrauterine, and Japarotomy was performed. After the fetus was extracted, the cyst, which was free and pediculated, was ligated and cut away. This proved to be one cornu of a bifid uterus (*uterus bicornis*). The pedicle was tied with catgut near its connection with the true uterine cervix, and was found, upon a careful examination, to be entirely impervious. The decidua was peeled off, the edges of the cut uterus brought together and sewed up with numerous catgut sutures, and the pedicle, thus secured, dropped with the remaining cornu uteri into the pelvis. There was no decidua or change in the other half of the duplex organ. The woman recovered in a month. Here the abnormal character of the pedicle, and the fact that when cut off it became simply an appendix to

the other portion of the uterus, no doubt aided, as in the operation of ovariectomy, to bring about the changes requisite for the healing process. As the patient of Dr. Taylor would, in all probability, have escaped death but for her own disobedience, we cannot entirely condemn the plan of dropping in the pedicle; but have only to say that the best results have followed the mode of external treatment, as devised by Porro.

With regard to the removal of the uterus "*as a necessity*," after unwittingly incising it in the gravid state, we have but to express our entire disapproval. With what possible propriety can an operator, who has already, without necessity, risked the life of his patient, add to her danger by unjustifiably extirpating her uterus, when he has not the excuse that the deformity or obstruction of her pelvis require that she should be placed in a condition to make a future parturition impossible? What excuse can there be for a Porro operation in a case where the woman may at another occasion bear a child naturally; as, for example, in a case of impaction of the fetus in a normal pelvis under long and powerful uterine pressure, such as have been several times safely delivered by the abdominal section in the United States? As an evidence that the plan of Porro is not required, we have only to instance the two cases where Mr. Spencer Wells and Dr. W. H. Byford perforated by mistake, each, a gravid uterus, when operating by ovariectomy, and then of necessity performed the Cesarean section. In both instances the uterus was sutured, and the patients recovered. Mr. Wells used a long-tailed, removable uninterrupted silk suture, and Dr. Byford, seven interrupted sutures of the same material. As these women were saved, where was the necessity of removing the uterus as advocated by Dr. Warren and the editor? In a climate like that of Australia, the Cesarean section should not be more fatal under favorable circumstances than in Louisiana and the West Indies, where it has been much less so than the Porro operation in Europe.

In these days of bold and venturesome abdominal surgery, we find operators too much inclined to test *de novo* the various methods for themselves, and not sufficiently influenced by the history of former cases. Primary laparotomy in extrauterine cases is very inviting to such men, and in theory is to be preferred to the secondary operation, in which there can only be one life saved. We frequently hear men advocating the removal of the living fetus in order to save its life; when, had they looked into the cases where this has been done, they would find them relatively much more fatal than the secondary operations. The

chief elements of danger in a primary case are the vascularity of the placenta, its abnormal character and connections, and the manner of its exfoliation, risking a hemorrhage, even long after the date of the operation. Although there is much risk in waiting until the proper time arrives for performing the secondary operation, there is less than in removing the fetus prior to its death, as at this period but few operated upon recover.

THE GENU-PECTORAL POSITION AS AN AID TO THE
RECTIFICATION OF MALPRESENTATIONS OF THE FETUS.

BY

CHARLES N. FOWLER, M.D.

TO THE EDITOR OF THE AMERICAN JOURNAL OF OBSTETRICS.

YOUNGSTOWN, OHIO, Oct. 5th, 1881.

I WAS very much interested in your exhaustive papers considering the diagnosis and treatment of obstetric cases by external examination and manipulation. I had a patient recently who baffled all means usually employed to correct malposition.

Mrs. Strubel, a healthy German woman, forty years of age, in nearly all her confinements had trouble from malposition of the child. I told her husband to call me when the first symptoms of labor indicated its approach, that I might correct the position of the child before the membranes ruptured. He called hastily and much alarmed, saying the "water had broken." When I reached the bedside, I found the child so firmly grasped by the contracting uterus that I was unable to change it from a transverse to the normal, or even a more favorable position than it occupied. It occurred to me that the knee-face position of the patient might enable me to do more for her. To my surprise, her lax abdominal walls, in that position, enabled me to bring the head down, and to elevate the breech so as to restore normal relationship to mother and child. Holding the advantage gained, the patient was permitted to resume the horizontal position. The change of position suspended labor for eight hours, but then progressed, as natural labor, safely to mother and child.

In the interval of uterine contraction, it was remarkable to observe the space left between the child and rim of the pelvis—by gravitation of the child, favored in this case by lax abdominal walls.

I adopted the knee-face position recently in a consultation case of cross-presentation before the rupture of membranes, succeeded in making the evolution in very few minutes, much to the sur-

prise of the attending physician, who failed with the patient in the usual position. I do not know the final result of this case, for the attending physician informed me that another doctor was called because we "stopped her labor."

As in the first case, correcting the position of the child suspended labor for some time—how long I do not know, but long enough to convince the patient and friends that we did not understand our business.

I have no doubt that the knee-face position will enable us to correct almost any malposition, even after the rupture of the membranes, by internal and external manipulation. To observe the effect, I have frequently put patients in this position (during natural labor), and find that in the interval of pain the presenting part of the child will fall some distance from the pelvic rim. By reference to all the authorities within my reach, I am unable to find any reference to the "genu-pectoral position," to facilitate external and internal manipulation in correcting malposition of the child, even before the rupture of the membranes.

I may overestimate the suggestion, but my limited experience induces me to hope its publication may enable others adopting it to secure like good results.

Very truly yours,

C. N. FOWLER, M.D.

YOUNGSTOWN, OHIO, Oct. 10th, 1881.

Since writing the report of cases, Oct. 5th, I have disposed of one still more interesting, as illustrating the advantage of the "genu-pectoral position" to facilitate external and internal manipulation, even after rupture of membranes, to change the position of the child in utero. The result in this latter case demonstrates, to my satisfaction, that by skilful manipulation in the interval of pains it is possible to bring the head down in the most marked malpositions. I can conceive of no more unfavorable case than the one I now report, as a test case.

Mrs. E . . . W . . . , of this city, aged twenty-two years, second confinement, was this morning, four o'clock A.M. astonished by sudden flow of water, unattended by pain, or other signs of labor. Thinking it was simply a flow of urine, I told the husband to let me know when pain indicated labor. I reached the bedside 10.30 A.M., and was astonished to find the hand and arm of child in the vagina (the left hand), and the head in right iliac region. The patient, under size and with small vagina, offered no flattering prospect for the child. I at once placed her in the knee-face position, and exerted pressure upon the head from left to right and upon the breech from right to left, until the position seemed to be corrected. By vaginal examination, I found the hand and arm had receded within the uterus, and the child's head engaged

in the superior strait. She was advised to get up that we might test the permanence of the change. Finding that the head retained its favorable position, I left her with orders to call me when pain indicated approaching labor.

I was recalled at 2.30 P.M., found the head firmly engaged in the pelvis, administered ether, and delivered her at 3.30 P.M. of a well-developed, healthy female child.

I will, hereafter, approach such cases with less anxiety than when I accepted the "dictum of authority," and delivered all such cases by the feet. In this latter case of narrow pelvis and rigid soft parts, the life of the child would have been sacrificed by pedal delivery. I am delighted with the result, and trust others will adopt the plan and report results.

Very truly yours,
C. N. FOWLER.

"COLUMNING" THE VAGINA IN PELVIC ADHESIONS.

BY

NATHAN BOZEMAN, M.D.,

New York.

TO THE EDITOR OF THE AMERICAN JOURNAL OF OBSTETRICS.

DEAR SIR: In the report of the proceedings of the late meeting of the American Gynecological Society, I find the names of yourself and nine other members of the Society recorded as having taken part in the discussion which followed the reading of Dr. Van de Warker's paper, entitled: "Forceful Elongation of Pelvic Adhesions."

Now, I think it will occur to you, as a participant in that discussion, that I took part also in what was said, and was as decided and emphatic in my opposition to the practice recommended by the author of the paper as any one of the other ten members of the Society whom you have mentioned in your report. Not only this; in my remarks I advocated gradual pressure without the use of an instrument in the cavity of the uterus, secured by columning the vagina, in the knee-chest or knee-elbow position, with carbolized cotton and cylinders of compressed sponges in oiled silk bags, as far preferable for certain reasons to the forcible movement of the organ by the internal use of any instrument. This I claimed as an original plan of treatment, by which any form of retroflexed uterus, with fixation against the rectum without adhesions, could be overcome and made to stand in its normal relationship to the bladder. With regard to adhesions between the uterus and rectum, I also said they were very rarely



Yours Truly
James P. White

met with in practice, according to my experience, and that there was a marked difference between retroflexion of the uterus with this complication and retroflexion with fixation, arising from plastic exudation in one or both broad ligaments, attended with displacement and imprisonment of one or both ovaries, the latter being the form alone in which successful treatment was thought to be possible.

In the discussion of the subject from my stand-point, I may have failed to make my views intelligible to you, or I may have opposed those of other speakers on the occasion, more in accord with your own views—I cannot say; but certain it is, as the matter now stands, I feel that you, as editor of an influential journal and chronicler of medical opinions, have been unfair towards me, to say the least of it, in the part of your published report referred to. I ask, therefore, as an act of simple justice, that, in the next issue of your JOURNAL, you publish a synopsis of my views on retroflexion of the uterus with fixation, as presented on the occasion in question, or this communication, which embodies the essential points of interest. Yours very respectfully,

NATHAN BOZEMAN.

296 FIFTH AVENUE,

Nov. 2d, 1881.

[The omission of Dr. Bozeman's remarks on the occasion referred to from the published report in the October number arose in an entirely unintentional oversight on the part of the stenographic reporter. As regards the peculiar method of treatment here described by Dr. Bozeman, my experience entirely corroborates his statements.—ED.]

OBITUARY.

JAMES PLATT WHITE.

DIED IN BUFFALO, N. Y., SEPT. 28TH, 1881.

THE subject of the above notice was born in Austerlitz, Columbia County, N. Y., March 14th, 1811. He was "a direct descendant of Peregrine White, the first male born in the Mayflower Colony." He pursued his classical studies under the Rev. John C. Lord, D.D., and at Middlebury Academy; he attended lectures at Fairfield Medical College in 1831-'32-'33; and Jefferson Medical College, Philadelphia, graduating from the latter in March, 1834; immediately after which he located in Buffalo, where he practised his profession until the time of his death, always true to the principles of legitimate medicine.

In 1846, assisted by Drs. Austin Flint, and Frank H. Hamilton, he procured a charter for the University of Buffalo and organized a medical department, in which he has occupied the chair of obstetrics and diseases of women and children, discharging the duties of teacher with signal ability. He was the first to take the ground that chronic inversion of the uterus can always be reduced, which he demonstrated as early as 1856, and has repeated the operation at various times. He also achieved considerable reputation as an ovariologist, having made the operation one hundred and fifteen times.

He was a member of the American Medical Association, its first vice-president in 1877; of the New York State Medical Society, its president in 1870; honorary corresponding member of the New York Academy of Medicine, and honorary member of the Rhode Island State Medical Society; he was twice president of the Erie County Medical Society and the Buffalo Medical Association; and was also a member of the American Gynecological Society. In 1876 he was delegate and one of the vice-presidents of the International Medical Congress held in Philadelphia. He was president of the faculty of the Buffalo Medical College at the time of his death, and had been president of the Board of Trustees of the Buffalo State Asylum for the Insane from its establishment until a short time before his death, when he resigned on account of ill health.

His contributions to medical literature have been numerous and valuable, both in his own department and in general medicine. He was active and efficient in the benevolent and public enterprises of the city, and many of them owe their existence to his efforts. He persistently declined political office, but his acknowledged abilities as a physician and public spirit as a citizen had raised him to places of great trust and responsibility. In the words of his friend and colleague, Prof. Thos. F. Rochester, "Dr. White was truly a great man in any position in which he might be placed—in the councils of the church, in civic matters, and in the discharge of his professional duties. Every one feels that a great and irreparable loss has been sustained. His name and nature will not soon be forgotten. The great point in his character, aside from his skill, was a determination and energy which never allowed him to go back."

JULIUS F. MINER.

DEPARTMENT OF DISEASES OF CHILDREN.

EDITED BY GEORGE B. FOWLER, M.D.

ORIGINAL COMMUNICATIONS.

ON SOME POINTS IN THE ETIOLOGY AND TREATMENT OF THE SCROFULOUS AND TUBERCULAR DISEASES OF YOUTH.

BY

THOMAS MORE MADDEN, M.D., M.R.I.A., Dublin, Ireland,

Physician to St. Joseph's Hospital for Sick Children, Dublin; Obstetric Physician Mater
Misericordia Hospital; Ex-Assistant Physician Rotunda Lying-in Hospital;
Formerly Examiner in Midwifery, etc., Queen's University, Ireland, etc.

THE following observations are mainly the result of clinical experience at the Dublin Hospital for Sick Children, in the wards or external departments of which upwards of twenty-five thousand cases of the diseases of childhood have now been treated. In a large and increasing number of these cases, the strumous diathesis was the *fons et origo malorum*. Thus, in 1872, when the hospital was opened, thirty-five per cent of the admissions were caused by scrofulous or tubercular disease, and in the present year this proportion amounts to forty-eight per cent.

Foremost amongst the causes of this increase of scrofulous and tuberculous disorders may be reckoned the indisposition to suckle their children now noticeable in women of all classes, and the unsuitable or injurious character of some of the substitutes for the only natural infant's food. Dr. Creighton and other recent writers have shown that tuberculosis in the human subject is identical with the tubercular bovine epizootic, known as *Perlsucht*. Moreover, those acute forms of tubercu-

lous disease, which are most common during childhood, have been observed by Cohnheim and Klebs to resemble closely the infective diseases in their zymotic origin from a specific virus, whether generated in the body from caseous matter or introduced from without. The latter is unquestionably generally the case in the tubercular diseases so common amongst the children of the poorer classes, into whose dietary tinned or preserved, as well as fresh cow's milk now enters largely. For there can, I think, be no guarantee that the cows furnishing this supply are not suffering from *perlsucht* or bovine tuberculosis, as the disease is very prevalent, and does not materially affect the quantity of milk.

Another cause of the increasing number of scrofulous and tubercular disorders is the physical deterioration of our people, arising from that wide-spread intemperance which is almost as general amongst women as it is amongst men, and the consequent toxicological effect of alcoholism on the wretched offspring of these drunken parents, who further pay the penalty of their progenitors' excesses by the development of scrofula and tuberculosis as the result of semi-starvation and neglect during the first years of life. This fact is continually forced on our attention in treating the scrofulous children of the poor at the dispensary attached to St. Joseph's Hospital, where we are daily obliged to supply, as far as possible, by preparations, such as the compound syrup of iron and lime, cod-liver oil, and extract of malt or maltine, etc., that food the want of which is a prime factor, in such cases, in the development of scrofula and tuberculosis.

Thirdly, local circumstances have much to do with the prevalence of scrofulous and tubercular diseases in Dublin. The situation of the city in the low lying, badly drained valley of the Liffey, and the densely inhabited tenements, too generally devoid of the most necessary sanitary requirements, in which the poorest class of a poverty-stricken population are crowded together, have, unquestionably, a deteriorating influence on the physical condition of the ill-lodged, ill-fed, and ill-clad scrofulous children, who from thence recruit our hospitals and prematurely fill our cemeteries.

It would be impossible to consider here so wide a question as the relation of scrofula to tuberculosis; but, I may venture

to reiterate my adherence to the older doctrine on this subject, which I have elsewhere discussed, and which was first impressed on my mind when a student in the wards of the scrofula-haunted Civil Hospital of Algiers, namely, that the scrofulous diathesis is the prolific and the primary source of all tuberculous disease, whatever part of the body may be affected, whether it be the lungs, the meninges or substance of the brain or spinal cord, the mesenteric glands, the cancellous structure or articulating surfaces of the bones, or the external glandular system.

The pathology of scrofulous lymphatic glands, as described by Professor Neves, and those other modern pathologists who believe in the distinctive character of scrofulous inflammation, seems to me rather to bear out its identity with tubercular disease. In both we find a morbid process commencing in the medullary or deeper portion of the affected structure; in both we find a tendency to the formation of giant or large cells, with glistening protoplasm; in both we have similar reticulated products of inflammation, the coagulated lymph, later on, becoming opaque and retaining the rounded form. As the disease advances, these opaque or caseous spots become foci of irritation, leading to suppuration and giving rise to purulent cavities, or infiltrations extending over greater or lesser areas of the inflamed structure. It would be useless, however, to trace further here this analogy between tubercular and scrofulous inflammation through all its stages.

In my work on "*Change of Climate*," the first edition of which was published many years ago, I dwelt on the evident connection between scrofula and phthisis, and, in the same work, I also pointed out the contagious or infectious character of these diseases under certain conditions. I may, therefore, be permitted to claim some interest in finding similar views now adopted on these questions by the most eminent recent pathologists.

The most frequent form of pulmonary tubercular disease that comes under treatment at the Dublin Children's Hospital is miliary tuberculosis, or, as the old writers well termed it, acute, or galloping consumption. In many instances, I have seen miliary tuberculization of the lungs pass through all its stages, from its first recognition until the patient's death, within less

than a month. In one of these cases, not ten days intervened between the commencement and the fatal termination of the disease.

The rapidity of the race towards death in such cases, as well as the generally attendant similar infiltration of the meninges and substance of the brain, the peritoneum, the liver, etc., leaves little room to question Buhl's view, viz., that "miliary tuberculosis is an infective disease, produced by an auto-inoculation with caseous matter in the body." At the same time it is unquestionable that, in some instances, this form of tubercular disease departs from its ordinary course; and, notwithstanding any theoretical opinions to the contrary, none whose experience is derived from actual clinical observation in the wards of an hospital, will question the fact that some cases of miliary tuberculosis are essentially chronic in their course. In such cases it would be almost impossible to draw any clear symptomatic distinction between chronic pulmonary miliary tuberculosis and true or catarrho-pneumonial phthisis, as developed in early childhood.

Cases of chronic miliary tuberculosis are, however, admittedly exceptional; and the catarrho-pneumonial or accidental origin of pulmonary tuberculosis, as the result of inflammatory action giving rise to caseation, is most evident in many instances in the rapid development of pulmonary tubercles as the sequence of bronchial catarrh and pneumonia in the strumous children of the poor who are brought into our hospital.

In such cases, the rapidity with which the prodromal catarrh of scrofulous children becomes developed into phthisis is often almost inexplicable, considering the multiplicity and complexity of the pathological changes involved in the progress of the disease, from the first invasion of an attack of bronchial catarrh to the caseous degeneration and more or less complete alveolar disintegration of the affected lung.

In another point of view, the increasing prevalence of scrofulous diseases among children, indicated by the records of our hospital, is of considerable practical interest. I now refer to the light which is thus thrown on the causation of the increasing frequency of those disorders which, in after-life, come under the special care of gynecologists. I have elsewhere shown that the scrofulous diathesis is the most frequent, and,

indeed, the general predisposing cause of chronic endometritis, cervicitis, ovaritis, and consequent functional derangements, including sterility.

As this fact is hardly yet as generally recognized as it should be, I take the opportunity of here repeating my belief in the close connection which exists between a strumous childhood and the subsequent development of chronic inflammatory uterine or peri-uterine disorders. This view, I may add, is grounded on clinical experience as a gynecologist in two large hospitals, in both of which I have found that a considerable proportion of the patients suffering from chronic uterine complaints were women of well-marked strumous habit or were suffering from some other evidently scrofulous disease.

In cases of chronic cervicitis, metritis, or endometritis thus caused, the local complaint is impressed with the characteristic scrofulous type. The cervical discharge in these cases closely resembles the glairy matter seen in the specific nasal catarrh of scrofulous children, and is attended with a similar tendency to produce excoriation of the mucous membrane, gradually extending to the submucous tissues. Strumous inflammation affecting the cervix uteri is apt to lead to follicular erosions, irregularly circular in shape, superficial in depth (flabby looking, and coated with a viscid, semi-purulent matter), possessing little or no apparent sensibility when touched, tedious beyond patience when neglected or maltreated, but readily curable when appropriate anti-strumous constitutional treatment is conjoined with the use of suitable local applications, too generally exclusively relied on in such cases.

The treatment of the disorders referred to in this paper is itself an almost inexhaustible subject, and obviously admits here of only a very brief reference to one or two salient points. That the curative treatment of these diseases has not advanced more than has been the case arises chiefly from the mistaken views that have so long prevailed as to the pathology of tubercular complaints.

Tuberculosis either originates from or is associated with malnutrition, general or local, and is generally connected with an otherwise evidently scrofulous diathesis. Hence, the first therapeutic indication under such circumstances is obviously to remedy the primary error of nutrition, by introducing suitable

nutriment into the system and to stimulate the digestive and assimilating functions to the use of the healthy pabulum so supplied. The treatment of tuberculosis must, therefore, be considered in its hygienic and dietetic as well as in a medicinal aspect. But, in the short time now at my disposal, I must confine myself to a few remarks chiefly concerning the hygienic and climatic treatment of the strumous diathesis and consequent tendency to tubercular disease. I may, however, premise that the dietetic indications which have been just referred to are to a great extent supplied by some of the food medicines which the advance of modern pharmacy has furnished us. Amongst these, the various combinations of maltine with cod-liver oil and other remedies hold an important place, and may be supplemented, according to the special exigencies of each case, by the different compounds of iron, lime, and other salts, which may be now presented to the most fastidious scrofulous child in the palatable guise of a toothsome syrup—such as those supplied by Parrish, Fellowes, or Dusart, or by Burroughs' beef and iron wine, a most valuable blood-maker; or by extract of malt, or by the employment of pancreatine, which is occasionally of much service in enabling strumous patients to digest the fatty and oleaginous matter, so needed in the treatment of all the wasting diseases of childhood.

In this connection, it may be observed that Carrageen moss (*Chondrus crispus*) is one of the most useful food medicines that can be tried in the treatment of the chronic disorders under consideration. This species of algæ, of which the sea shores of Clare furnish an inexhaustible supply, was recommended upwards of half a century ago by Mr. Todhunter, of Dublin, as an anti-strumous remedy. But, at the present day, the value of Carrageen moss, in this way, and as an article of diet, appears generally ignored or unknown; and, hence, I take this opportunity of bearing my testimony to its utility as an abundant, cheap, easily prepared, palatable, and generally serviceable article of food for children suffering from any of the chronic diseases which are connected with the scrofulous diathesis.

In the treatment of the chronic scrofulous disorders of childhood, pharmaceutical remedies must be assigned a place entirely subsidiary to hygienic and dietetic management. In

most of these cases treated at St. Joseph's Hospital, cod-liver oil, whether used by the mouth or by inunction, was employed, though more as a food than as a medicine.

Iodine is admittedly the only drug for which anything like a specific property can be claimed in strumous cases, and the reason that more benefit is not generally derived from its employment is probably that it is now seldom given in the metallic form and in the long-continued minute doses originally advised by Lugol, in whose hands much benefit was derived from its use. I have found no more useful combination in many instances of general glandular scrofulous disease than a few drops of tincture of iodine given with iodate of quinine and iodate of iron, until iodism was produced, and conjoined with the application of cataplasms of *fucus vesiculosus* over the affected parts.

The hygienic and climatic treatment of chronic strumous disorders is a subject of considerable practical importance; and, although we can only extend the benefit of favorable hygienic and climatic conditions to an unfortunately too small class of scrofulous patients, still so great are the remedial advantages of such treatment that it obviously demands our careful consideration. On this point I may venture to speak with some confidence, having devoted attention to the influence of change of climate and the uses of mineral waters in the treatment of chronic scrofulous and tubercular complaints during several years passed in various southern health-resorts, and repeated visits to foreign spas. I may here repeat that the general accuracy of my views as to the therapeutic uses of these sanatoria has been best corroborated by the freedom with which they have been borrowed from my works on "*The Health Resorts of Europe and Africa*," and on "*The Spas of Germany, France, and Italy*" by other writers.

Change of climate and the use of mineral waters are especially advantageous in the treatment of the tuberculous and scrofulous diseases of early life. All these complaints are essentially chronic, and, hence, the action of our remedies should in such cases be almost as gradual in their operation; for no brief course of treatment, however judicious, can be expected to counteract the constitutional effect of years of chronic disease.

The mineral waters most generally serviceable in the chronic disorders of strumous youth are the iodated and bromated saline springs, of which Wildegg in Switzerland is that from which I have found the greatest benefit derived. Besides Wildegg, we have a sufficient choice of the *jod- und bromhaltige Kochsalzwässer*, as they are termed, at Kreuznach, Hall, and Salzhausen; whilst, if the circumstances of the case do not permit of a visit to one of these more strongly iodated German spas, we have an English watering-place at Woodhall Spa, hardly inferior to any of its foreign rivals.

The simple chalybeate mineral waters are very generally useful in the management of most of the strumo-tubercular diseases of early life. Waters of this class, such as Spa or Schwalbach, containing the carbonate of the protoxide of iron in the most easily assimilated form, with excess of carbonic acid gas, are powerfully tonic and stimulating, increasing directly the number of red blood-corpuscles and amount of hemoglobuline, both of which are so much diminished.

The thermal arseniated waters of Royat, Mont Dore, Bourbonne les Bains and St. Vectaire, in the volcanic district of Auvergne, as well as at St. Sauveure, in the upper Pyrenees, are especially beneficial in the treatment of scrofulous glandular enlargements and strumous arthritic diseases.

Cold sulphurous waters, of which Lisdoonvarna and the crown well of Harrogate are perhaps the most generally useful, are also serviceable in some forms of these chronic affections. But the thermal springs of this class, such as Eaux Bonnes, Aix les Bains, Aix la Chapelle, and Schingrad, although occasionally prescribed with much benefit in cases of scrofulous glandular and arthritic complaints (being powerfully stimulating in their action on the vascular and cerebro-spinal nervous system), always require great caution in their use, and are especially contra-indicated in cases of active tuberculous disease.

In change of climate we have another, and, as I believe, a most effectual remedy for chronic tubercular disease. There are no cases in which the beneficial influence of change of climate may be so confidently hoped for as in children who are predisposed to consumption by the scrofulous diathesis. Their constitution being yet unformed, may be expected to receive and retain whatever impression a pure, bracing, or

mild air can produce; and thus they may be enabled to safely pass the critical period intervening between childhood and puberty. The climates suitable for this predisposition to phthisis should be dry, moderately warm, and bracing—dryness of atmosphere being the essential condition.

At present, the health-resorts most in vogue for this class of patients, and in many cases very judiciously selected for them, are the cold, dry tonic climates of Alpine districts, such as Davos-Plaz, in the elevated table-land of the upper Engadine, and other similarly situated mountain sanatoria, of which there are several in the United States, as well as in the old world (Adirondack mountains in New York State, Ashville in North Carolina, and numerous elevated regions of Colorado, and the Rocky Mountains).

The primary effect of a cold dry Alpine climate and of a pure mountain atmosphere, such as that of Davos-Plaz, is unquestionably tonic and bracing in the case of a still moderately strong, albeit strumous youth, in whom a tendency to tuberculous disease exists and has been fostered by life in the impure, variable, and humid atmosphere of any of our overcrowded centres of population. When such a patient is removed from one of these hot-beds of tuberculosis to a dry, cold climate like Davos, the respiration becomes more energetic, more oxygen being required, and more carbonic acid exhaled, to supply which the increased food, especially of a fatty character, is consumed. Thus, blood is directly enriched, the proportion of hemoglobine and red corpuscles, the oxygen carriers, being augmented, and the general nutrition of the system is improved; but, on the other hand, those whose constitutions have been longer and more seriously affected by the serofulous cachexia or its local manifestations, must be injured by exposure to the cold rarefied atmosphere of an Alpine height. In such a climate, if the patient's vital energies had been previously lowered by chronic disease, the blood repelled from the surface of the body by cold must be driven back on the internal organs; and, if active pulmonary disease be developed, then the diminished pressure of the atmosphere in these Alpine health-resorts, and the sudden and frequent variations in the electrical condition and temperature, as well as the pressure of the air to which such places are necessarily subject

must affect the balance of the circulation, and produce more or less pulmonary irritation, if not congestion or hemoptysis.

Hence, from extensive personal experience of the effects of change of climate, as observed in most of the health-resorts frequented by invalids from these countries, I would venture to deprecate the too general adoption of Alpine sanatoria in all cases of consumption which is now coming into fashion; nor, indeed, does it need any such experience to show that change of climate, like all other remedies, must be prescribed on rational principles and with due regard to the special condition of each individual patient.

In selecting a winter residence for children suffering from, or predisposed to any chronic tuberculous disease, primary consideration should be given to the comparative facilities and inducements for open-air exercise which are afforded by different health-resorts. As a general rule, consumptive children are disinclined or are unable to undergo any fatigue, and love to hang over the fire, whence their friends fear to disturb them "lest they might catch fresh cold." But how mistaken this view is, needs no argument; for such children free exposure to pure fresh air, and sunlight are all essential. Hence, in choosing a health-resort in these cases, preference must be given to whatever place the climate of which will permit, with safety, of the maximum exposure to the open air, and the situation of which will afford the greatest inducements and opportunities for out-door exercise. In these respects, it must be admitted that the new Alpine health-resorts are not as unfavorably circumstanced as the older ones of Pau and Mentone, from which, however, they also differ in all other respects, climatic and topographical.

The same objection also applies to those artificial sanatoria which are now sometimes recommended in lieu of sending invalids to winter abroad in climates which some suppose can be thus imitated under roof at home. Nor, for the same reason, can even the best British health-resort, such as Ventnor, Torquay, or Glengariffe, however suitable in other respects, be compared as to the all-important facilities for open-air exercise throughout the winter and spring months, with those the invalids might daily enjoy in a dry, warm, and equable climate, such as that of Malaga. Moreover, in our home health-resorts, not only are

valitudinarians confined to the house by cold or wet during the greater part of the winter, but also they are there further injured by an atmosphere contaminated with carbonaceous matter from the coal fires and gas-lights which, in English houses, continually irritate the sensitive lungs of a pulmonary invalid.

Too commonly we are not consulted in the cases of strumous or tuberculous children until the patient has become no longer a subject for treatment in any of the Alpine health-resorts just referred to, and most generally then, if change of climate be determined on, the locality chosen should be one, the atmosphere of which is moderately warm or equable, as well as dry. Of such places we have an abundant choice; and of them, according to my experience, the most suitable winter or spring retreats for tuberculous refugees from our cold, damp, and variable climate are Western Australia, Upper Egypt, and Malaga.

NASAL CATARRH IN THE NEW-BORN: ITS INFLUENCE ON RESPIRATION AND NUTRITION.

BY

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NEW-BORN children are so frequently affected with catarrhal diseases of the upper respiratory passages, and these play such an important rôle in their future well-being, that a short review of the effects produced by them may be of interest.

I have been careful not to report any cases which are of rare occurrence, but have detailed such as may be met with in the daily experience of any physician.

In August, 1880, I was called to Long Branch to see an infant of five weeks that, owing to some difficulty of respiration, was wasting away from slow starvation. On examination, I found a child, well developed, free from any discoverable taint or cachexia,

presenting all the outward signs of marasmus. The mother informed me that at birth her babe weighed over ten pounds and, as asserted by the physician and all the *femmes sages* in attendance, was as fine a child as one could wish to see. I was informed that, while at rest or sleeping, no marked difficulty of respiration was noticed, but as soon as the child was put to the breast, or the nipple of the nursing bottle put into the infant's mouth, it would make several efforts at suction and, after a snort and a sputter, give it up as all in vain. The only alternative was to feed the little sufferer by means of a spoon, and the result was that it was threatened with ultimate starvation. Close questioning failed to reveal any history of "snuffles," and honest answers to my questions satisfied me that there was no cause for suspecting any specific taint in the parents.

The attending physician had at this date ceased his visits, and when I called on him he very readily informed me that he had seen the child daily for some weeks and failed to find any disease of either the heart or the lungs. During my first visit, I requested the mother to put the child to her breast, and I then observed the process so graphically described above. This was also the case when the nursing bottle was administered, but since the little fellow was already somewhat exhausted from his previous efforts, the struggle was not so severe, nor were the acts of inspiration as forced as before.

The supposition was that I had to deal with some obstruction of the upper respiratory tract, situated in either one or more of the cavities of the nose, pharynx, larynx, or trachea. Although, owing to the extreme youth of the patient and the small size of the organs, it was not possible to introduce the laryngeal mirror. I was able to eliminate any obstruction in the two last-mentioned cavities by examining the little patient when asleep. It breathed regularly, with its mouth open, about twenty-four times a minute, and on auscultation of the lungs and trachea, I found that the air passed in without any difficulty. Compression of the nostrils had no effect. There was loud snoring. Depression of the tongue revealed a pharynx markedly hypertrophic; large folds of mucous membrane running up and down. Passing the index finger of my right hand into the pharyngeal cavity, no other mode of exploration being feasible, and upwards into the naso-pharynx, I found that there was a large number of villous growths filling up the entire space. The child was now wide awake, and I experienced great difficulty in examining the anterior nares. At last, by introducing a small aural speculum into the two nostrils successively, and throwing light into the nasal cavities by means of a head mirror, I was able to get a tolerably fair view, and found the middle and inferior turbinated bones very much congested and tolerably hypertrophied. The discharges from the nose and naso-pharynx were profuse and, as a result of the inability of the little patient to expectorate, vomiting was frequent, even when no food had passed into the stomach for several hours previous. At this visit, the child which, at

birth, had weighed ten pounds, only weighed nine pounds four ounces, showing that it had not gained any during the five weeks of its existence, but had actually lost ground.

As the parents were very anxious that something should be done without delay, I instituted a course of treatment which was as follows: The nasal cavity was thoroughly cleansed with a solution of sodium bicarbonate by means of an ordinary male urethral syringe; the stream being thrown into one nasal fossa, and allowed to pass from the opposite side. This was done four or six times in succession, until all the mucous secretion, inspissated and otherwise, was removed. This being accomplished, I introduced a platinum probe, wound with cotton soaked in a twenty-five-per-cent solution of the pernitrate of iron, into the two fossæ successively, taking care that the entire surface of the two inferior meati should be bathed with the solution. By curving the probe, I was able to pass it downwards and backwards, so that it passed over the entire surface of the posterior pharyngeal wall.

This process was repeated twice daily for a week. The child was always able to take nourishment after the operation and, as I was told by the mother, slept quietly and peaceably for several hours together. As the improvement was not progressive, I determined to employ more radical measures for the removal of the main cause of all the trouble, *i. e.*, the adenoid vegetations at the vault of the pharynx. In a youth or an adult I should have employed the pharyngeal forceps, or, preferably, the galvano-cautery which, in my hands, has yielded the most satisfactory results. The small size of the cavity of the pharynx precluded the use of these apparatuses, and I therefore made use of a small Meyer's spoon-shaped curette, which I commonly employ for the removal of polypoid growths in the external auditory meatus. Passing this curette, firmly attached to a long handle, into the right nasal fossa, back into the naso-pharynx, I introduced my left index finger into the patient's mouth up toward the vault of the pharynx, and, feeling the curette, proceeded to scrape away the redundant tissue. This was done repeatedly, and was followed by some hemorrhage, which I soon checked by applying a pledget of cotton dipped in the solution of iron. On the following day, I repeated this procedure on the left side, and cleared the passage to my satisfaction. There was little or no reaction, and the child improved almost perceptibly from day to day. Early in September he was taken to the White Mountains, and from that day to this has not presented a single untoward symptom.

In June, 1881, Mrs. G. brought me her little son, aged four months, who was afflicted with severe ear-aches accompanied by a profuse purulent discharge on both sides. The mother stated that when the child was about three weeks of age it caught a severe cold which was characterized by profuse mucous discharges from the nose and mouth, loss of appetite, restless sleep, and fever. This continued for some time; and, as the little patient continually tossed its head from side to side, moaned in its sleep,

cried almost incessantly while awake, and vomited frequently and freely, the physician in charge considered it a case of meningitis, and applied treatment accordingly. After more than four weeks of suffering, nearly all of the above symptoms disappeared spontaneously, and in their stead the watchful mother observed a profuse purulent discharge issuing from both ears. This had lasted for more than three months, and for the relief of it the child was brought to me.

To all appearances the little one was fairly well-developed. Close questioning of the mother and consultation with the physician failed to elicit any evidences of syphilis, scrofula, or tuberculous disease. The skin was moist, the limbs firm and well developed, but on closer inspection, I observed that at every inspiration the nostrils were widely distended. After removing the clothing, I found that every time the child took a breath, the abdomen was drawn violently inwards. This pointed to some obstruction of the upper respiratory tract, which was readily located in the nasal cavity; for, when the child was put to the breast, I found that the symptoms just mentioned were more marked than before, and, at the same time, it was only able to suckle for a few moments successively, when it had to release its hold on the nipple in order to take a long inspiration.

On examination of the throat, I found the pharynx studded with follicular enlargements, and its surface covered by enlarged blood-vessels. Inspection of the nose showed decided turgescence and hyperemia of the entire pituitary membrane, presenting the characteristic appearances of a subacute nasal catarrh. Since rhinoscopic examination was not feasible, I introduced my right index finger into the cavity of the pharynx, but failed to find any decided signs of hypertrophy. After cleansing the ears, which were filled with pus, I found perforations of both tympanic membranes, and on the right side considerable granulations in the cavity of the ear. Owing to the extreme youth of the patient, I was not able to determine the hearing power.

The nature of the case was now clear. The child had contracted a severe acute coryza which, not being properly treated, was allowed to go on till, by continuity, it had extended into the retro-nasal space, whence it had passed into the Eustachian tubes, causing an acute inflammation of the middle ear. This, enduring longer than usual, was the cause of the pain, fever, and restlessness of the child. In the course of the inflammation of the middle ears, there was a formation of pus which was not able to find an exit through the Eustachian tubes, owing to their swollen condition, and the probable occlusion of the nasal orifices. It was, therefore, necessary that the pus should find another mode of exit, else there would be an accumulation and probable extension into the adjacent mastoid cells. Fortunately the drum-heads are not so dense but that the imprisoned fluids can force a passage through them. This being done, all pain disappeared, and with that came a gradual improvement which would have

been more marked, had there not been a continual waste of tissue owing to the persistent otorrhea.

The course of *treatment* which I instituted consisted, 1, in the administration of tonics, such as iron and quinine, and 2, in the maintenance of the greatest possible cleanliness. The nares were thoroughly cleansed, twice daily, by means of a coarse spray of a solution of boracic acid, the pus was removed from each ear by means of pledgets of medicated cotton, as often as was necessary. I applied a solution of the pernitrate of iron to the diseased mucous membrane of the nose and throat, and made insufflations of a powder composed of equal parts of oxide of zinc and boracic acid to the ears every other day. The granulations of the right middle ear were removed by means of a small curette, and within a few weeks the discharge had ceased and the perforations had healed.

The little patient continued to improve steadily, and for some months past has shown no signs of illness beyond an occasional cold, which is readily dissipated after the administration of several small doses of quinine.

Physiologists teach us that, in health, the process of respiration does not take place through the mouth, but through the nose. "The ingoing air, by exposure to the vascular mucous membrane of the narrow and winding nasal passages, is more efficiently warmed than it would be if it passed through the mouth, and at the same time the mouth is thereby protected from the desiccating effect of the continual inroad of comparatively dry air" (Foster). It must also be borne in mind that the mucous membrane is covered by ciliated epithelial cells, which serve the purpose of entangling and arresting the further progress of any particles of dust, dirt, etc., which might otherwise pass into the larynx and lungs.

If, however, there be any disease or diminution in size of the nasal or naso-pharyngeal cavities, it is evident that the normal respiratory act cannot take place in the manner intended. If this be long-continued, the interference with normal breathing will give rise to a general impairment of health which, in some cases, is attended with very grave consequences.

Diminution of the calibre of the upper respiratory tract will impair both breathing acts in direct ratio to the degree of obstruction. If the diminution be due to neoplastic growths in the naso-pharynx, expiration will be most impaired, inasmuch as the tumors, being forced upwards and forwards by the escaping current of air, must cause a certain obstruction

of the channel, making impossible for the current of air to find its exit in this direction with the necessary ease and rapidity. It must, therefore, seek another outlet, which will naturally be through the mouth. If, however, the anterior nares are diminished in size, either by inflammation or hypertrophy of the mucous membrane, or turbinated bones, or by the presence of a growth or some abnormality in the position of the septum narium, both acts of respiration will be impeded, and the mouth will have to act in part, if not altogether, vicariously. The consequence is, that respiration, instead of being an involuntary, unconscious act, becomes voluntary and conscious. The patient experiences numerous uncomfortable sensations, and the fulness and number of respirations is interfered with in many ways. Mastication and deglutition are also affected when there is disease of the naso-pharyngeal cavity, which retards the ingress and egress of air. When the food has been sufficiently masticated, it is gathered into a bolus by the movements of the tongue. This being raised, the bolus is thrust back between it and the palate through the isthmus of the fauces. Before the bolus reaches this point, the soft palate is raised by the levator palati muscles, and so brought to touch the posterior wall of the pharynx. By the contraction of the palato-pharyngeal muscles, the edges of the posterior pillars of the fauces are straightened, and thus they tend to meet in the middle line, the small gap being filled up by the uvula. The entrance into the posterior nares is, therefore, almost completely occluded, and the apnea, due to the fact that during this process no respiration can take place through the mouth or naso-pharynx, causes an undue precipitancy in swallowing, which forces the food into the stomach before it has been sufficiently ensalivated and subdivided. In young children, this in itself may be sufficient to cause gastric and intestinal disturbances.

The nutrition and consequent development of infant children is also retarded when there is nasal catarrh, thickening of the mucous envelope of the turbinated bones, or hypertrophic tissue in the cavity of the pharynx. The obstruction of the passages makes it difficult for the little patient to take a sufficient quantity of food; because, while sucking, the vicarious respiratory function of the mouth is necessarily suspended, and

the diminution of the volume of the current of air makes thorough inflation of the lungs impossible. After a few mouthfuls of milk or food are taken, the little one finds that it must cease for sheer want of breath; the hold of the nipple is loosened, and a crying fit generally sets in, which, of itself, does not tend to restore the normal respiratory act. Repeated efforts of this kind cause so much fatigue that the little one cannot persist, and we often find that sleep is preferred to nourishment. I have even known instances where a repetition of these futile attempts causes such an aversion on the part of the little sufferers that, after a time, they cannot be induced to take the breast or the bottle, as the case may be.

Where the secretions of the diseased membranes are very profuse, we will find that retching and vomiting are frequent phenomena. Generally, these symptoms are attributed to some disease of the stomach, *per se*; but this is commonly not the case. I am inclined to think that in many cases it is due solely to reflex irritation, and in others to accumulation of mucus in the stomach.

The nervous supply of the pharynx comes from the spinal accessory and glosso-pharyngeal nerves, both of which are intimately connected with the pneumogastric nerve after its exit from the skull through the foramen lacerum. If there be an accumulation of mucus in the pharynx, which, owing to its viscosity or position, is difficult to dislodge, the repeated effort of expectoration will cause irritation of the two former nerves, and this being transmitted to the pneumogastric fibres supplying the stomach, it will, after successive retchings, become so disturbed that all of its contents are ejected. If this state of affairs is allowed to continue, the viscus will become so irritable that the slightest disturbance in the pharynx may cause violent contractions and emesis. This also will interfere with nutrition, because the food which enters the stomach, instead of being digested and allowed to pass into the intestines, where it is to be assimilated, is unceremoniously thrown out.

Expectoration is a conscious and voluntary act which very young children are not able to perform. The mucus collected in the nose and naso-pharynx, instead of being expelled, either through the nostrils or the mouth, drops down into the lower

pharynx, where it lodges on the posterior wall or upper orifice of the esophagus. Deglutition, voluntary or otherwise, sets in, and the plug is gradually pushed down into the stomach, but not without carrying with it a goodly quantity of atmospheric air, which by its bulk must distend the walls. The mucus being a foreign body, stimulates the action of the gastric juice, causing a fermentative change and evolution of carbonic acid gas. The size of the stomach becomes too great, and contraction of the muscular fibres ensues, with the usual result—vomiting.

As this process is also continued during sleep, the rest of the little patients is greatly interfered with, and when they have become a little older, they will be afflicted with night-mare—sometimes to such an extent that the prospect of sleep is attended with no little alarm.

When these conditions have lasted a number of years, an abnormal shape of the thorax may be observed. Wagner,¹ in his treatise on the diseases of the soft palate, says, that hypertrophied tonsils in children, if allowed to continue in that condition, sometimes influence development of the thorax. It does not grow in the same proportion with the rest of the body. The lateral walls are compressed, the sternal portion is protuberant, and the result is a pigeon's breast or the breast of Dupuytren. On the other hand, the sternum may be depressed and the lateral walls protuberant and the muscles of the thorax so weak that they cannot properly exercise their functions. This is due to the small quantity of air entering the lungs, the insufficient force of the current and the relatively greater power of the external atmospheric pressure.

The appearance of the nose and face is also unusual. They do not develop apace with the rest of the body, the *alæ nasi* are frequently sunken and flabby, the roof of the mouth is deficient in size, more arched than it should be. The alveolar processes of the superior maxilla are very narrow, and, in consequence of this, the space for the upper teeth is contracted, and they assume an irregular shape and position. The peculiar appearance of the face is readily noticed. The lower jaw is

¹ Von Ziemssen's *Handbook of Pathology and Therapeutics*. German edit., vol. vii., 1st part, p. 216.

generally dependent, and the result is an elongation of the upper lips at the corners of the mouth, the labio-nasal fold is obliterated, and sometimes a dragging of the inner angle of the eyes may be noticed, although this is a very rare appearance. The forehead is often wrinkled, producing an impression of great pain on the part of the sufferer.

A CONTRIBUTION TO THE TREATMENT OF PERTUSSIS.

BY

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OUR periodicals are so full of hints, and our *materia medica* is so replete with remedies relating to whooping-cough, that one would be led to infer that its successful treatment is accomplished with the greatest facility. There are few medicines that have not been recommended and tried by the profession, condemned and thrown aside as useless. Neither need we express surprise at this, when we take into consideration that little or nothing has been known concerning the cause of this disease; and even to-day, notwithstanding positive assertions from Letzerich, that have been verified by Tschamer, a great many will be found who maintain that the essence of pertussis lies in a bronchial catarrh, or in a neurosis. Most modern authorities, however, admit the infectious nature of the disease, and as such it awaits the decision that will come regarding the etiology and essence of this whole class of diseases. With this part of the subject, however, we are not dealing at present, except in as far as the method of treatment may tend to corroborate the views expressed by Letzerich.¹

In order to do justice to any treatment of whooping-cough, it is necessary to see the various ways in which treatment may

¹ Jhrbch. f. Kinderhknnde, 1870, iii., 354; 1873 436 (from Virchow's Archiv).

cause beneficial effects to follow. In the words of Trousseau, "a method of treatment is of value if cure results in less than six weeks, or, in that, at least, the frequency and intensity of the attacks are diminished by it. We would demand a trifle more from an ideal treatment. We desire 1, a positive effect upon the duration of the disease; 2, an effect upon the paroxysms; 3, a prevention of sequelæ and complications, 4, a reduction in mortality; 5, prophylactic properties. In the light of these five points, we wish to examine the method that I have used in the ninety-seven tabulated cases. They have all been treated by myself, and have received the closest attention. I intend some time to be able, by collecting comparatively large material, to answer positively the question of the value of one method of treatment.

The method now to be detailed is a modification of the one suggested by Letzerich, in the article mentioned above. It consists of the insufflation of quinine. Letzerich, in his original article, recommends 0.01–0.015 grammes of chloride of quinia, 0.015 grammes of bicarbonate of soda, and 0.25 grammes of powdered acacia, to be divided into ten powders. One powder is to be blown into the throat twice a day. I use 1.00 of quinia: it matters not whether the sulphate or chloride, and 0.50 each of bicarbonate of soda and pulverized acacia. In this combination, the quantity of quinia is increased, this according to my view being the active agent of the combination, the other two remedies being considered more in the light of adjuvants, although the bicarbonate of soda undoubtedly possesses antimycotic properties. For the purpose of insufflating, I make use of the ordinary insufflator, such as is used in Schrötter's laryngoscopic clinic in Vienna. I prefer this instrument to those that are operated with a bulb; and there are several reasons for this preference, the principal one being that it is steadier, and can be better held in place, so that there is less danger of causing laceration of the mucous membrane. I first fill the insufflator with the powder, then introduce it so that its distal curve corresponds with the curve of the soft palate, being careful not to touch this, its point being slightly hidden by the base of the tongue. Older children I ask to phonate, and then insufflate: in younger ones, I wait until crying begins, and then blow the powder into the throat. As soon as the insufflation is made, the patient reacts, as will be seen further on, usually by an attack of

coughing. Monti' says of this method: "These insufflations, according to my experience, can be carried out successfully only in older and intelligent children, and their effect, when carried out conscientiously, is undoubtedly good." By referring to my table, it will be seen that I have limited myself neither by the age nor by the intelligence of my patients, two of my cases, 13 and 95, being only three months of age. Perhaps, Monti's experience may be due to the fact of his finding it necessary "in severe cases to insufflate once every two hours, and, in less intense cases, three or four times a day." When using the method at first, it always becomes necessary to use more or less force, my experience having taught me that few children are good-natured enough to permit the introduction of an instrument into their throat. Infants and very young children are held as they would be for applications to the conjunctiva, and, in them, it frequently becomes necessary to hold the nose, in order that they may open their mouths, for the purpose of introducing the insufflator. In older children, it rarely becomes necessary to use force after the first two or three insufflations have been made. At first, the operation is always followed by an attack; if this does not occur, it is evidence that the powder has been blown into the pharynx or esophagus. As the treatment is continued, and as improvement sets in, the attacks, after insufflation, are replaced by a slight clearing of the throat, or an ordinary short cough, proving that the powder has found its way into the larynx. In very irascible children, it sometimes occurs that the approach of the physician with the instrument is sufficient to cause an attack of pertussis; in these cases, it is best policy to await the ending of the attack before performing insufflation. Assuming that the lesion is first localized about the folds of the epiglottis and in the larynx, the object of the treatment is to blow the powder over these regions, and, if possible, to cause it to adhere. The insufflations must be made twice a day, less being of little value, and more seeming unnecessary. This is proven by the fact that if one or more applications should be omitted, the number of attacks that had previously decreased will again increase. If the insufflation be made oftener than twice a day, and one or more of these be omitted, however, no effect will follow, provided the two daily applications be kept up. The treatment must begin as soon as the diagnosis is made; as soon

¹ Keuchhusten, *Real-Encyclopädie d. g. Heilkunde*, vii., 1881.

as the whoop is heard. But, in families in which there are several children, one of them having whooping-cough, if a second begins to cough, the treatment ought to be used immediately (see cases 81, 82, and 96).

When a beneficial effect follows the treatment, we may expect it upon the fourth day, and it is usually noticed first during the night. The reason for this probably is, that the psychical influences which cause attacks of coughing are in abeyance, and the specific cause of whooping-cough alone is allowed to operate. In the series of cases reported, this has been the rule. It will not be surprising to the physician, therefore, trying this method for the first time, if the first three days of treatment give little or no relief. It is to this fact, and also to the unpleasant nature of the treatment, that its want of general favor can be ascribed. Physicians have tried the method, not used it conscientiously, or, perhaps, not long enough, and then have thrown it aside, as belonging to the same class of remedies so frequently vaunted in our periodicals. It is, indeed, a great undertaking for a physician in active practice to see a patient suffering "only with whooping-cough" twice daily, and then to know that, in the beginning of his treatment, when one application is missed, the attacks will again increase. For these reasons, in some cases occurring lately, but not embodied in this report, I have instructed the parents in the use of the instrument, and so far have had very good results, but in not sufficient number of cases to warrant any positive conclusions.

The subjoined cases are reported under the following headings: first, the name and age of the little patients; secondly, the time of treatment; thirdly, any remarks that may become necessary in order to facilitate an understanding of the method. The treatment has been continued as long as the whoop manifested itself, as I soon saw that it would be impossible to continue it until the cough from such sequelæ as occurred would cease.

It is, then, a treatment against the paroxysmal stage, and as such, will receive attention, as also, in connection with the other points, tending towards an ideal treatment of this disease. Where no remarks are made, it is taken for granted that the treatment began with the second stage of the disease, as very frequently the children are brought to my observation when the diagnosis of whooping-cough could only be suspected; then a placebo would be administered, until the characteristic paroxysm

made its appearance. The only way to insure satisfaction to both the physician and the patient or his surroundings, is to cause an accurate record of the number of attacks to be kept. This has been done in the cases reported, and the deductions given are made from these reports.

No.	NAME.	AGE.	DURATION.	REMARKS.
1	John E.	6 yrs.	13 days	Has been whooping for five days. Has a decided bronchial catarrh. 6 and 7 were brought in together, 7 having whooped for ten weeks before being brought for treatment, and 6 just having begun.
2	John H.	3 yrs.	6 days	
3	Martin E.	17 mos.	9 days	
4	James S.	4 yrs.	10 days	
5	Thos. P.	4 yrs.	7 days	
6	Mary D.	5 yrs.	6 days	
7	Michael D.	13 mos.	14 days	
8	Alice McK.	8 mos.	10 days	Has been coughing for two weeks, the whoop present for one week.
9	Maggie B.	6 yrs.	21 days	
10	Wm. D.	6 yrs.	11 days	
11	Joseph St.	3 yrs.	13 days	
12	Lizzie A.	5 yrs.	9 days	
13	Sarah C.	3 mos.	11 days	
14	Mary O.	9 mos.	14 days	Brother of 17. Carbolic acid inhalations were administered without result; also bromide of potassium. Both of these were given a trial of three days; then the insufflations were begun, and the whoop disappeared in four days.
15	Alice C.	2 yrs.	11 days	
16	John McG.	18 mos.	4 days	
17	Mamie McG.	7 yrs.	10 days	
18	Mary C.	9 yrs.	3 days	
19	John B.	3 yrs.	14 days	
20	Chas. T.	6 yrs.	11 days	The patient has been sick for four months. Had measles, then typhoid fever. He has had pertussis for two weeks; in addition, he has phthisis and catarrh of the large intestine.
21	Mary B.	6 yrs.	14 days	
22	Lis. T.	10 mos.	7 days	
23	Annie McH.	15 mos.	17 days	
24	Tom C.	2 yrs.	3 weeks	
25	Nettie C.	5 yrs.	5 days	
26	Katie W.	7 yrs.	5 days	
27	— W.	4 yrs.	3 days	} The same family; they had had the disease, respectively, three, one, and two weeks.
28	— W.	3 yrs.	8 days	
29	Thos. O. N.	9 yrs.	7 days	
30	Celia L.	2 yrs.	5 days	Has been coughing for seven weeks. Has had the whoop for two weeks.
31	Rosa F.	5 yrs.	4 days	

No.	NAME.	AGE.	DURATION.	REMARKS.
32	David L.	2 yrs.	no result	
33	Tillie R.	17 mos.	13 days	
34	Nanny H.	2 yrs.	12 days	
35	Freddie F.	27 mos.	7 days	
36	Theresa D.	3½ yrs.	11 days	
37	Maggie D.	3 yrs.	17 days	
38	Chas. H.	6 yrs.	21 days	
39	Sammy S.	7 yrs.	no result	} Same family.
40	Wm. S.	3 yrs.	11 days	
41	Ella S.	6 mos.	4 days	
42	Jas. S.	4½ yrs.	8 days	
43	Katie R.	6 yrs.	10 days	
44	Rose M.	4 yrs.	7 days	
45	Mary S.	3 yrs.	9 days	} Same family.
46	Robert S.	11 mos.	3 days	
47	Laura S.	3 yrs.	10 days	} Same family.
48	Wm. S.	3 mos.	4 days	
49	John M.	18 mos.	7 days	Has been coughing for two weeks.
50	Chas. O'N.	2 yrs.	8 days	
51	Mary McK.	5 mos.	11 days	Has had the whoop for one week.
52	Jos. S.	6 yrs.	9 days	} Same family.
53	Clara S.	3 yrs.	12 days	
54	Florence W.	10 mos.	5 days	
55	Moses R.	4 yrs.	no result	
56	John D.	3 yrs.	12 days	Has been coughing for two weeks.
57	Louis F.	5½ yrs.	11 days	Has been coughing for six weeks.
58	Annie S.	3½ yrs.	14 days	
59	Ellen H.	7 yrs.	12 days	
60	Jenny B.	2 yrs.	13 days	
61	Philip F.	14 mos.	12 days	A marasmic child of tuberculous family.
62	Katie F.	4 yrs.	11 days	Had measles; but had whooping cough three weeks before this. She has been coughing for five weeks.
63	Josie L.	6 mos.	10 days	Has chronic catarrh of the small intestine. Has been sick for two months.
64	Augusta C.	3 yrs.	2 weeks	Has coughed for two weeks.
65	Mary W.	5 yrs.	11 days	Began to whoop one week before treatment was begun.
66	Josie J.	4 yrs.	9 days	Has coughed for two weeks.
67	John A.	21 mos.	3 days	
68	John C.	9 yrs.	10 days	Has coughed for three weeks.
69	Stella J.	21 mos.	6 days	Has coughed for five weeks.
70	John S.	5 yrs.	7 days	
71	Lizzie G.	5 yrs.	10 days	} Has coughed for five weeks.
72	Rosie G.	2 yrs.	3 days	
73	Eddie S.	1 yr.	10 days	} Same family. Have all been coughing for three weeks; began together (?).
74	Willie S.	5 yrs.	11 days	
75	Andy S.	3 yrs.	13 days	} Same family.
76	John S.	7 yrs.	9 days	
77	Neoni M.	9 yrs.	10 days	
78	Hester M.	6 yrs.	9 days	

No.	NAME	AGE.	DURATION.	REMARKS.
79	— K.	8 yrs.	In neither case could a result be obtained, principally on account of irregularity in treatment.
80	— K.	6 yrs.	.....
81	Walter A.	6 yrs.	8 days	
82	Jos. A.	8 yrs.	Same family as 81. The child began to cough. No whoop was at any time present, and upon insufflation, the cough disappeared.
83	Marie M.	14 mos.	2 weeks	Same family.
84	Birdie M.	7 yrs.	no result	
85	Clarence M.	6 yrs.	no result	
86	Walter D.	5 yrs.	11 days	
87	Ernst S.	14 mos.	10 days	
88	Walter F.	2 yrs.	2 weeks	
89	Estella A.	8 yrs.	14 days	
90	Jenny H.	6 mos.	3 weeks	
91	Estella H.	18 mos.	3 weeks	
92	Walter F.	2 yrs.	14 days	In the second week of treatment, the child was attacked with capillary bronchitis; this, however, subsided in a few days, and the treatment was then continued.
93	Racie H.	18 mos.	3 weeks	
94	Freddie H.	2½ yrs.	4 weeks	Same family.
95	Nettie H.	3 mos.	2 weeks	
96	Alvin C.	6 yrs.	3 days	
				Was infected by 89, but after three days of treatment, the cough disappeared, the child having whooped but once.
97	Rachel W.	3 yrs.	no result	

Of these 97 cases, 52 were females, 45 males; the same influence of sex seeming to be present that has been noticed by the authorities, notably West.¹ The age of the cases ranges as follows: The youngest was three weeks, and the oldest nine years of age.

Between birth and one year of age, 10 cases.

"	one	"	two years	"	13	"
"	two	"	five	"	43	"
"	five	"	nine	"	31	"

It will furthermore be seen from the report that five cases were treated without any result, or at least none sufficient to be called positive, in the way of diminishing either the duration of the disease or the intensity of the attacks. In cases 32, 79, and 80, failure had to be ascribed to irregularity in the applications, but yet they were sufficiently tried to cause me to embody the

¹ Diseases of Children, p. 387, 1874.

cases in this report. They were, to me, of especial importance because they gave me occasion to study the effects of interrupted treatment which has already been spoken of.

These, however, are by no means all the cases from which I have been able to draw conclusions as to the value of this treatment. A good many were not treated with sufficient regularity to warrant insertion in the tables; in them, however, the difficulty was that the cough had so much decreased, after a few days' treatment, that the parents thought it unnecessary to bring the children, and the cough then reappeared in a few days with renewed vigor. Cases 84, 85, and 97 were totally without results, and, furthermore, no explanation could be found why the treatment should prove without the desired effect. It will be seen that 84 and 85 belong to the same family with 83, in which the whoops disappeared in two weeks. Case 97 was of a phthisical family, in which one child had been lost with tubercular meningitis. The patient herself was of what is known as scrofulous habit, suffering frequently with nasal and bronchial catarrhs, angina tonsillarum, and having hyperplasia of both tonsils, as well as of the lymphatics of the neck. Whether or not this had an influence upon the treatment I am unwilling to say, especially when looking at cases 17 and 61, in which the treatment was followed by the best effects. We must, then, leave the explanation for these three cases until our experience in failures has increased, so that, by comparison, we may be better able to determine the cause of non-success.

It is now our duty to ascertain in how far this treatment corresponds with that which we considered an ideal one. In the first place, does this treatment affect the duration of an attack of pertussis? We may set the following down as an axiom: if any one stage of the disease is shortened, the whole disease is shortened. Let us then see, if possible, how long the spasmodic stage lasts when the disease is allowed to take its own course. Again I repeat that this treatment, according to my experience, affects *par excellence* the spasmodic stage. In looking through the various works on children's diseases, I find the following data given regarding the duration of the spasmodic stage. Naturally, these must be taken as average results, as the duration varies with the patient, the surroundings, the season of the year, and the nature of the epidemic. Barthéz and Rilliet¹ state that this stage lasts from

¹ *Traité des Maladies des Enfants*, ii., p. 623, 1861.

fifteen to sixty-five days, most commonly from thirty to forty days; West¹ makes the duration four weeks; Condie,² three or four weeks; Bouchut,³ fifteen or twenty days, sometimes several months; Gerhardt,⁴ from two to ten weeks, usually one month; Vogel,⁵ four to eight weeks; Hüttenbrenner,⁶ two to five weeks; Henoch,⁷ four weeks; Monti,⁸ four to six weeks; Steiner,⁹ three to eight weeks.

We see from this superficial collation of authorities how widely the estimates differ; but even taking the lowest estimate, two weeks, it will be seen from my table that, in the main, the result of the treatment must be considered as exceedingly favorable. In the cases treated from the beginning, the average duration was ten days; in all cases treated, 9.6 days. If, however, we take the average duration of the second stage of several epidemics, we will find that Gerhardt and Henoch's statements are probably nearest the truth, and, taking this into consideration, we come to the conclusion that our treatment succeeds in shortening the spasmodic stage by more than one-half. It is proper to add here that the table of cases embraces observations made during the last five years, so that they really represent average observations, *i. e.*, observations of five epidemics. It is difficult to compare this method with others, because nearly all observers have taken the whole duration of the disease into consideration, not giving specific data concerning the second stage. Steffen¹⁰ tried inhalations of common salt, tincture of opium, or tannic acid, and seems to be satisfied with results varying from two to thirteen weeks, one case dying of pneumonia early during the treatment.

Now, in regard to our second desideratum, *i. e.*, the effect upon the attacks. Here we must examine into both the number and intensity of the attacks, and from this stand-point we proceed to study the exact record of one of our average cases:

CASE LXXXIX.—Estelle A., æt. 8 years, first came under

¹ Lectures on the Diseases of Infancy and Childhood, 1874.

² A Practical Treatise on the Diseases of Children, 1868.

³ Traité Pratique des Maladies des Nouveaux-nés.

⁴ Lehrbuch d. Kndrkkhten., 1874, p. 133.

⁵ Lehrbuch d. Kndrkkhten., 1876.

⁶ Lehrbuch d. Kndrhknde., 1876.

⁷ Vorlesungen über Kndrkkhten., 1881.

⁸ L. c.

⁹ Compendium d. Kndrhknde.

¹⁰ Jour. f. Kndrhknde., 46, p. 6.

observation on the 12th of November, 1877. She then had a cough, most violent at night. Examination of the chest revealed nothing; there was noticed only a slight redness about the fauces. Having been exposed to whooping cough, the opinion was given that the case might develop into one of pertussis, and it was retained for further observation. On the 15th of November, the mother again brought the child, stating that it had whooped. I then asked for a few days more, and accordingly, on the 19th of November, the attacks being well developed, I began treatment. What the result was the following table will show:

NUMBER OF ATTACKS.

Nov.	Day.	Night.	Nov.	Day.	Night.
19th.	8	10	27th.	3	Slept all night.
20th.	9	12	28th.	6	Slept all night.
21st.	9	11	29th.	2	1
22d.	7	7	30th.	0	0
23d.	7	5	Dec.		
24th.	6	3	1st.	2	0
25th.	7	1	2d.	0	0
26th.	5	Slept all night.	3d.	Dischrgd	

These tables might be multiplied; but one serves our purpose completely. It will be seen that the case began, when first under treatment, as one of moderate violence; during the first three days of treatment little effect was produced, that after that the attacks became less numerous, until on the night of the eighth day of the treatment they disappeared for the first time. On the twelfth day, the child passes twenty-four hours without an attack, having two on the thirteenth, and none on the fourteenth day of treatment. It must be borne in mind that the parents were directed to make a stroke upon their record whenever the child whooped, so that this will account for the two attacks on December 1st. The same that has been said concerning the number of attacks is true for their intensity. Thus, after the sixth or seventh day of treatment, frequently much later, the reprise would still be marked, but so faint and incommoding the child so little, that, unless carefully observed, the attacks would not be noticed.

For the prevention of sequelæ and complications, the following has been observed: Of the 97 cases, only one was affected with capillary bronchitis. If we compare this with the statistics published by modern authors, we find our results exceptionally brilliant.

Thus, Wm. Macall¹ reports 307 cases. Of these, 61 had bron-

¹ The Glasgow Med. Journal. Jhrbch. f. Kinderhklkunde., N. F., vi.

chitis, 18 broncho-pneumonia, and 4 lobar pneumonia. Thomsen and Neubert¹ report 17 cases, of which six had capillary bronchitis, but none died. Heubner² reports 48 cases, drawing from a material of 77. Of the former, those reported in detail, 4 were complicated or had sequelæ; of the latter, 8 were uncomplicated. In regard to simple bronchitis, an additional statement is necessary: this has been found to be present in a great many of my cases, and has not been taken into account. Believing it to be due to swelling of the mucous membrane, in the majority of cases confined to the very large tubes, and not to any specific cause, I have thought it wise to take no account of it. We may say that it is in no wise affected by the treatment; indeed, it may and does continue after the whooping-cough has entirely vanished, frequently disappearing only after long-continued treatment or change in the season.

The value of the treatment can be best appreciated, when we take into consideration the fact that not one case was lost. Comparing this with the results obtained with other methods, we will see that this, indeed, is a remarkable result. Looking at the mortality of whooping-cough in general, we see that it varies from 1.9 to 37.8%. West (l. c.) states that in London "it ranks fourth among the causes of death under five years of age." Löschner,³ out of 5,726 cases, lost 113 (1.9%); Gerhard (l. c.) quotes him as stating that the mortality is as 1:27, or 30; Monti (l. c.) judges the mortality to be from 2.7 to 15%; Steffen⁴ gives $\frac{1}{40}$ of all cases; Macall (l. c.) lost 7.8%; Biermer,⁵ who has made, perhaps, the best collection upon the subject, puts the average mortality at 7.6%; Heubner (l. c.), treating the cases partly upon antinycotic principles, partly by general medication, lost 7 cases out of 74; Topf,⁶ using insufflations of salicylate of soda, bicarbonate of soda, salicylic acid, and inhalations of carbolic acid, lost 8.7% on the whole, not a very great reduction in mortality.

The highest mortality reports come from the French authorities. Brochin⁷ reports the following remarkable results: In the

¹ *Jhrbch. f. Kinderhknnde.*, N. F., xvii.

² *Jhrbch. f. Kinderhknnde.*, N. F., xvi.

³ *Epidemiologische u. Klinische Studien*, 1868.

⁴ *Ziemssen's Handbuch.*

⁵ *Virchow's Handbuch.*

⁶ *Archiv f. Kinderhknnde.*, ii., 4 and 5 (Review).

⁷ *Dictionnaire Encyclopédique des Sciences Médicales*. Coqueluche, 1877.

epidemic at Arras, 1864, 15 cases out of 42 died; in that of Perpignan, 1865, 33% were lost, in 13 departments, 1867, out of 796 cases, 23 died, and the Hôpital des Enfants, 1867, the mortality was 37.8%. Far from claiming that this method can prevent a lethal termination, I must, however, insist that it gives much better mortality results than any other method that has been used heretofore. Looking at the mortality as given by our authorities, we see that the lowest is that of Löschner 1.9%. Not having lost one case, we must therefore, on this point, ask for additional time before we can come to a positive conclusion. It may be that in our next cases some complication, not having occurred before, will set in; or that some sequela not noticed in the past will be observed. A further explanation may be offered, in that our number of cases is not large enough to warrant absolute deductions. Yet no equal number of whooping cough cases has, as yet, been reported, treated by whatsoever method, that can show such excellent results. In addition, as has been stated above, these cases have not been taken from one epidemic, so that the objection could have been raised that the results are due to the mildness of the type then prevailing. Neither are these cases taken from the best classes of private practice; they have been collected from my material in the polyclinic at the medical college of Ohio, and from my own practice. They therefore, in respect to station of the patients, which in whooping cough, as well as in any other disease, is a factor not to be disregarded, represent an average in which the balance is rather on the side of the poorer classes. The final conclusion, then, is not unwarrantable, that the mortality is very much reduced by this method of treatment.

In regard to the last point, the prophylactic properties, I can say little positively. In looking through the table of cases, it will be seen that numbers 16 and 17; 26, 27 and 28; 45 and 46; 47 and 48; 52 and 53; 71 and 72; 73, 74, 75 and 76; 77 and 78; 79 and 80; 83, 84 and 85; 93, 94 and 95, were in the same families. The majority of them had treatment applied in the beginning of the cough, as will be seen by reference to the column of remarks, and only in one case of these reported, ninety-six, did I succeed in preventing an outbreak of the disease. There are additional instances, however, that I have not reported, in which it seems as if the prophylactic properties of the treatment were well marked. I would, therefore, hesitate

very much in giving an opinion regarding this point, reserving for this also a more extended period of observation. In conclusion, then, this method corresponds to an ideal one in the following points:

I. A positive effect is produced upon the duration of the disease.

II. A positive effect is produced upon both the number and intensity of the paroxysms.

III. Complications and sequelæ are diminished in proportion to the effects *sub* I. and II.

IV. Mortality is very much reduced.

V. Prophylaxis must still be considered doubtful, yet the treatment ought thoroughly to be tested in this direction.

OBSERVATIONS ON EIGHTY CONSECUTIVE CASES OF DIPHTHERIA.

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FROM its description in 1789, by Bard, who called it "angina suffocativa," and the more elaborate paper of Bretonneau (presented to the "Académie Royale de Médecine," in 1821, and in which it was first designated diphtheritis) to the present day, very much has been written concerning this dread disease. The many articles in our journals, the elaborate monographs, and the consideration given it by our standard authorities, seem to have left no method untried whereby its ravages may be diminished. An attempt to add anything more to its already voluminous literature may seem presumptuous, yet my excuse must be the favorable mortality in my cases, as compared with that usually stated. According to our most recent observers, the death rate is much too high. McKenzie states that "it ranges above 50 per cent in some epidemics. In 1546 persons attacked in the Florentine epidemic (1872-3), 881 died." Oertel claims a general mortality of 40 to 50 per cent, and in

the croupous form as high as 90 per cent. Jacobi gives a very high death rate in laryngeal diphtheria, 95 per cent; but states that, if energetically treated, the average death rate is 5 to 10 per cent. Lewis Smith, Meigs and Pepper, and in fact the majority of American observers, differ but slightly from these figures.

In face of the above facts I may be pardoned for relating the history of an epidemic of eighty cases of diphtheria occurring during ten months, where the mortality was but 7 or $8\frac{3}{4}$ per cent. I did intend to give a tabulated history of each case, but the space at my disposal will not admit. The history and general deductions are taken from my daily clinical notes, and, in view of the general severity of the epidemic and favorable results of treatment, may prove of some value.

The epidemic began August 2d, 1880, and continued until the following May. The causes are obscure. During a residence of six years in this locality, I have seen about half a dozen isolated cases annually. The extent of territory invaded may be estimated as covering an area of one-half mile by four miles. The population, numbering about 1,000, is engaged principally in manufacturing. The geological formation is limestone, and the surface of the country is rolling, having a descent averaging one hundred feet to the mile. It is well drained, being situated upon the outlet of Skaneateles Lake, in Onondago County. There is no stagnant water. Water supply obtained generally from wells. Sanitary condition of inhabitants above the average of manufacturing towns. The character of the epidemic was severe, no case being noted where the membrane was not distinctly formed, and the symptoms were generally grave. The two types, catarrhal and croupous, were easily recognized in this epidemic, and many of the latter were malignant.

The catarrhal form readily assumed the croupous, and complications were of frequent occurrence. In many, the attack began with convulsions. The membrane in average cases entirely enveloped the fauces in twenty-four hours. The temperature I found could not be relied upon as in other diseases; many severe or fatal cases having no extreme elevation. In the outbreak of the epidemic, I pursued various

plans of treatment, relying mainly, however, upon topical applications of tr. iron and carbolic acid, with constitutional measures. But the general course of the disease was unsatisfactory. From experimentation in several extremely severe cases I ultimately adopted the following treatment:

When first called, I administered gr. v. of the hydrarg. chlorid. mite, to be repeated every four hours until several thorough evacuations are produced. The following is then administered:

R Tr. ferri chlorid. ʒ ss.
Sol. potass. chlorat. (saturated),
Syr. simp. āā ʒ xiv.
M. Sig.: 3 i. every hour.

I apply externally to the throat salt pork cut thin and rubbed full of table salt, being secured by bandage tied over the vertex, the pork extending from ear to ear. I touch the throat, in ordinary cases, once daily, in severe, twice (rarely more frequently) with absorbent cotton secured in a Noyes' sponge-holder, and saturated in the following:

R Ferri persulphat. 3 i.
Glycerin.,
Pure cider vinegar āā ʒ ss.
M.

This in my hands, when gently applied (not swabbed), has the effect to penetrate the deposit, which shrivels and falls off. It also serves to coagulate or harden the tissues beneath, rendering them less pervious to septic absorption. Upon no account is force to be used, or the usual swabbing to be resorted to. Gently placing the cotton in apposition and gentle pressure will suffice. The throat I atomize frequently, depending upon severity of case, with

R $\frac{1}{2}$ Ferri persulphat gr. x.
Pure cider vinegar,
Water āā ʒ ss.
M.

In the nasal form, especially, I have found this of great benefit, if inhaled at time of application. The atomizer used is the W. and T. Phenix which I find most convenient.

The atomized fluid must be well applied to the affected

parts for a few minutes. With young children, this is often very troublesome; but always know that it is done, or your results will not be satisfactory. Gargles of brandy and water, chlorate of potash in saturated solution of water or vinegar, according to form and severity of disease, are useful; but in no instance fail to use the atomizer at least hourly. As the membrane forms more rapidly at night, atomize half-hourly, and, in extreme cases, at quarters. More stimulation is necessary during the night.

Good and judicious nursing is necessary. Know personally that your instructions are obeyed. An unexpected visit in the middle of the night has more than once proved beneficial. See and know that enough nourishment is taken. The diet should be milk, in quantities of not less than a quart daily, beef-tea, etc. Stimulants I administer from the first, except in mild cases, preferring good Bourbon or rye whiskey. The quantity should be gradually increased, the pulse being our guide. I came nearer losing more cases from heart-failure than any other cause, and latterly pushed the whiskey. Know that the kidneys act properly. Bowels must act every forty-eight hours. Caution patients, if old enough to heed, about swallowing any of the membrane, as its action on the stomach is toxic. The administration of quinia sulphas, gr. iss.-ij., potass. chlorat., gr. v., every six hours, I think valuable. The cases must be isolated as much as possible. Disinfectants and fresh air *ad libitum*. All discharges must be received in vessels containing saturated solution of cupri sulph. ; where practicable, change the linen daily; all soiled clothing and linen should be thrown into boiling water before washing. After convalescence, the room and contents to be shut up, and thoroughly fumigated with sulphur thrown upon a pan of live coals; and, after severe cases, where sanitary condition was not all that could be desired, a daily fumigation is necessary. Care must be exercised during convalescence, for fear of relapses. Diphtheritic paralysis occurred in but two of my cases, and gradually disappeared, under a course of iron and strychnia, and a good diet. Pilocarpine I tried in one case, but did not push it, and probably returned too quickly to former measures. Its results, however, were negative.

I am enabled to speak knowingly of the efficacy of the plan

of treatment just described, on account of having suffered from two attacks of diphtheria myself during the epidemic, the symptoms being severe.

I first acquired the disease from close attendance (as at times I had twelve upon my list, the majority seen twice daily), and the attack was extremely severe. Membrane very thick, re-forming quickly, and persisting four and a half days. Prostration extreme during active period. Malignant tendency for twelve hours. Diminished heart-power and danger of heart-clot on fifth day. Convalescence rapid, owing to robust health. At work on ninth day. Loss of twenty pounds during sickness.

My second seizure, acquired from too prolonged exposure to the breath of case No. 68, where the tonsils were sloughing, and the nasal cavities required plugging on account of hemorrhage. My throat bled constantly for twenty-four hours before the appearance of the membrane, which was of the greenish, malignant sort, and which continued to form for three days, treatment and stimulation being in the mean time energetic. The right tonsil partly sloughed. Throat left weakened, and, at present date, is very troublesome. Convalescence more protracted, owing to previous hard riding, with much night-work. That recovery in both instances was due to the topical measures employed, I feel assured; for, when they were withheld, the membrane did not fail to re-form most rapidly, and unpleasant symptoms began to manifest themselves.

An analysis of my *fatal* cases gives the following results :

CASE I.—Nasal hemorrhage and asthenia were the causes of death. This was unavoidable, and almost assured by the neglect to which it was subjected, not having any treatment until forty-eight hours previous to death. CASE VI.—Hemorrhage from erosion of blood-vessels in posterior nares was the cause. This case I saw for the last time forty-eight hours previous to death, when everything was progressing finely ; throat nearly clean ; but, owing to my illness, it passed into the hands of a medical friend, who informs me that it died from hemorrhage twenty-four hours after he assumed charge. CASE XVII.—Death was caused by the overwhelming attack and systemic infection. The membrane formed so rapidly, and blocked the fauces so completely that scissors had to be used to cut it away and prevent immediate suffocation. CASE XIX. was convalescent; membrane entirely gone, with no reappearance for forty-eight hours. Death caused suddenly by paralysis of heart. CASE XXXVI. was malignant, and died from severity of blood-poison. CASE LXVIII. very severe; took a malignant form in fifty-two hours; tonsils sloughed; nasal hemorrhage. CASE LXVI.—Death, I think, from asthenia. The last time I saw him, forty-eight hours previous to death, he was better, and wished to be dressed. Had the disease very severely; croupous form. Measles developed upon seventh day,

and throat cleared up, so that the membrane was limited to the size of a split pea on right side. Owing to my second seizure, I was unable to see him. Neighboring physicians assumed charge, and inform me that death resulted from prostration.

To sum up: *Fatal* cases, 7; from the disease alone, 3; from complications, 4. There were, therefore, but 3 cases whose fatal termination is owing the severity of throat complications, and in whom treatment was without apparent benefit. The remainder succumbed to complications. Yet, in them the topical measures advocated were successful in relieving the fauces of the diphtheritic deposit.

At the meeting of the American Medical Association in Richmond, in May, 1881, Dr. Whittaker, of Cincinnati, referred to the efficacy of the subsulphate of iron, and several articles in current journals mention it. I am, therefore, not alone in vouching for its usefulness.

REVIEWS.

THE DISEASES OF CHILDREN: A PRACTICAL AND SYSTEMATIC WORK FOR PRACTITIONERS AND STUDENTS. BY WM. HENRY DAY, M.D. Second edition, rewritten and much enlarged. Philadelphia: Presley Blakiston, 1881, pp. 752.

This is a somewhat bulky volume (in fifty-three chapters), too large for a concise manual, too incomplete and cursory for a comprehensive treatise. In many respects it has not the merits of either form. There is a lack of condensation and incisive expression, clearly defined ideas, and precise statement. There is a great deal of wordiness and of futile generalities in some parts, especially in the earlier chapters, where the author devotes much space to certain symptoms or conditions which he raises to the dignity of diseases proper. On the other hand, there are many diseases peculiar to children, especially of the new-born, which are unmentioned, and still others which are passed over with disproportionate brevity. In these days "of the writing of many books," we look to see a writer on a special subject confine himself as far as possible to the matters of his specialty, and as there are already several excellent treatises in the English language on diseases of children, we have some difficulty in seeing the particular "want" which this book fills, unless we can discover some special excellence in the author's personal contribution to our knowledge of the subject or in the summing up of recent information on pediatrics.

He says "the diseases of children have a claim to be considered separately and specially." "All practitioners of medicine will ad-

mit that the diseases of children should be regarded in a distinct light from like diseases of adults." . . . "The remarkable peculiarities which disease assumes in children . . . make this study very important."

This is excellent doctrine, but is not always followed by the author. There are too many instances where the descriptions of disease seem to be adapted from the common text-books on adult diseases.

Thus among other diseases, typhoid, pleurisy, croupous pneumonia, variola, are said to be initiated by rigors—an occurrence which, we venture to say, is seldom seen by the busiest practitioner among children, even in intermittent fever.

It is common knowledge of the profession that in infancy and childhood a convulsion is often the representative of the rigor in adults. Croupous pneumonia (with its crepitant r le) is described as if it were a common disease of childhood, whereas authorities agree that it is very rare, especially under two years of age; thirteen pages are devoted to this variety and only three and a half to lobular or catarrhal pneumonia. If these numbers were reversed, they would hardly represent their relative importance, a knowledge of the latter being quite as important to the student and physician as that of any disease treated in the work. Various sputa of bronchitis as they appear in adults are described, whereas a student should be told that young children do *not* expectorate, but swallow the sputa. Again, in pleurisy the diagnosis is made to depend in a measure upon the pain and the patient's peculiar sensations, whereas young children furnish little information in this direction. The discussion of asthma occupies twelve pages, of emphysema eight, and of echinococcus of the liver three (nearly as many are given to catarrhal pneumonia), two pages are devoted to acute yellow atrophy of the liver, while one page is allowed to varicella, two to cyanosis, and a short addendum of a fraction of a page to the important subjects of typhlitis and perityphlitis. No mention is made of malarial fevers which are quite worthy of discussion in a work for circulation in this country or the tropics. In the chapter on typhoid fever, the entire lesions described are the severe ones of adults, while in children they are well known to be slight. The mildness of the nervous symptoms and the modifications of the temperature curve in childhood are not brought out.

Some of the most valuable information in the book is contained in the quite extensive quotations from various good authorities which are duly credited. In fact, the clear and clean-cut statements of some of these, contrast sharply with the vague and loose expressions of the author in immediate connection therewith. The clinical outline of the ordinary diseases, the directions for diagnosis, and the remarks upon pathological anatomy lack explicitness and accuracy. This will appear as we examine the work more in detail.

The author devotes separate chapters or sections to the consideration of debility, marasmus or atrophy, ascites, palpitation, and neurosal affections of the heart. Cyanosis follows a brief paragraph on malformations of the heart, as if an independent condition. A separate discussion of a clinical group of symptoms may be useful in some instances, but here we think matters are carried too far.

"By debility I mean functional impairment, atony, weakness, or preternatural slowness in the performance or working of the

vital processes, leading, when neglected or overlooked, to debility (and it may be to structural change) in one or more of the great central organs of life or tissues of the body." "I claim for this a separate and special classification among the ailments of children." Nevertheless "the loss of blood or free purgation or deficient food, or any causes that reduce the vital powers of the patient, will induce debility, etc." Later on, constipation and coated tongue, etc., are given as symptoms of this debility. Why is not debility a symptom properly coming under the heading and as a *result* of hemorrhage, etc.? Yet he adds later: "In the diseases of adult life, a cause is often discovered. Not so in the cases I am describing." "These cases of pure and simple debility, when neglected, cause chorea, epilepsy, convulsions, paralysis, etc., and finally lead to those changes which originate anemia, tuberculosis, and every form of diathesis that lowers health and provokes disease." We think this is decidedly "putting the cart before the horse."

Under the head of "marasmus or atrophy" it is said that "atrophy consists in the decrease of size of a tissue or of the whole body, with consequent impairment of function." We consider wasting to be in many cases a *result* of impaired function.

"Atrophy is a common *disease* among infants and young children," etc. Now where we diagnosticate marasmus we are simply repeating in Greek what the old women say when they tell us "the child is wasting away," and we are none the wiser for pedantry. Students also, for whom this book is in part written, are already quite too apt to rest content with merely giving a symptom a learned name and pass on to treatment. It is of the greatest importance that they be strongly impressed with the necessity of tracing every symptom to its exact cause, if possible, and also of understanding the mechanism of the morbid process which is giving rise to symptoms. There are, however, useful remarks in the remainder of the chapter, which might have been extended somewhat with advantage, this marastic condition being of such frequency and importance in children.

A chapter is given to that terrible bug-bear, dentition. We are told "every thoughtful practitioner ought to be on the watch for indications of diseases, which the process of dentition is capable of exciting, . . . almost any sympathetic disorder may spring up, as . . . meningitis, etc." Among the causes of difficult and delayed dentition is put tuberculosis. Nevertheless, children of the tubercular diathesis walk, talk, and cut their teeth early (Jenner). We are also given the doleful information that the mortality (from this process) is variously estimated as a sixth to one-half of all the deaths. We can only say that we have yet to see the first one, although we have been looking for it for a long time. Nearly all authors, however, feel called upon to give some pages to the consideration of the "diseases of dentition," but the best authorities continually add the warning to the reader that it is doubtful if the symptoms given depend, after all, upon the evolution of the teeth. In fact, the frequency with which the diagnosis of "dentition" is made, is inversely to the diagnostic acumen and careful observation of the physician. The author has never seen "ulceration of the gums follow" lancing. In our experience, it is not at all uncommon. In another chapter, he says, when the child exhibits certain nervous symptoms, the "gums are red and tender, and although other teeth are not appearing nor distending the gum, they are probably at no great distance. It is always well to puncture

this inflamed gum with a lancet and give a freely acting purge." We think it about time this digging into a gum for an expected tooth should disappear from the practice of educated physicians.

Much of the Pathological Anatomy in the work is made up of summaries and quotations, and is correct, but, in many instances, the remarks upon the general characteristics and nature of disease are peculiar and original. Under Gastric Catarrh, he gives, from Rokitsansky, the lesions of the gastric mucous membrane in drunkards.

When the bulk of the elastic spleen is increased in liver affections or arrested skin action, "if these disorders continue, the spleen fails after a time to propel the blood forward." (!)

In "Scarlatina Anginosa," the tonsillar exudation is spoken of as "yellowish lymph," and as a "fibrinous or sloughing exudation." This is about all the information we are given on the subject. Its relations to diphtheria might well have been touched upon. Diphtheria is defined as "a contagious and epidemic disorder, characterized by a specific inflammation of the pharynx and air-passages, attended with exudation of fibrin or other lymph, and the enlargement of the cervical glands." The expression "fibrin or other lymph" does not convey a very clear meaning to our mind, and glandular enlargement is certainly not an invariable attendant in mild cases. The chapters on Croup and Diphtheria are very unsatisfactory, at least as to the discussion of the nature and pathology of these affections. Many of the old-fashioned distinctions, which have been quite exploded, are here reproduced. He says, "in diphtheritic croup, the disease is of a well-marked constitutional character, and is *always* accompanied by great depression and nervous symptoms." In our experience, where the membrane occurs first in the larynx, and extends scarcely at all into the pharynx, the constitutional symptoms, before the respiration is impeded, are very slight, and we have seen children so affected lively and playing about, with fair appetite and with no fever.

"If croup were identical with diphtheria, it seems to me that the operation of tracheotomy would rarely succeed," etc. Nevertheless, we can recall at once a case of a child now living, upon whom, when nearly moribund, we performed tracheotomy six years ago, who exhibited (before the operation) no constitutional depression whatever, not even much loss of appetite nor any fever, although there was some membrane on the pharynx and a small patch on the tongue. Another case occurred within the last month, in which there was abundant pharyngeal exudation afterward, extending into the larynx, with some symptoms of blood-poisoning and intense dyspnoea, but no fever, and still this child recovered, after tracheotomy, although there was some sloughing of the wound, and in spite of the fact that it was undoubtedly diphtheritic croup.

It would be well if the term croup were abandoned as a name of a disease, and restricted to designating a symptom merely, viz.: laryngeal obstruction.

One more instance only of the author's pathological ideas will be given. In the article on Tubercular Meningitis, he says: "The arachnoid is closely adherent to the pia mater, except where the latter membrane dips into the convolutions and the arachnoid stretches across them. Here the tubercles, in cases of meningitis, are most abundantly seen, and they are often found in this situa-

tion when they cannot be detected in any other. This looks as though the *membrane* had some *attraction for the deposit*, etc." (!)

In the important matter of etiology, there are some striking statements made which cannot be said to throw much light on the causation of disease. Some are quite meaningless, as where "loss of tone in the peritoneum or lymphatics" is made a cause of ascites, and where "a torpid and sluggish liver," in children, is given as a cause of cirrhosis. "Teething is not an uncommon cause of infantile paralysis," as well as directly or indirectly of many other diseases. Also, "blows and falls upon the hip have caused this form of paralysis," of all of which we have never seen any evidence. "Rickets and tuberculosis are common causes of psoriasis." We have seen above that tuberculosis also delays dentition, according to the author. Albuminuria, as a sequel of scarlatina, is regarded as a result of exposure to cold, whereas the direct action of the specific poison on the kidneys is quite sufficient of itself to excite a nephritis.

Differential diagnosis is too meagrely treated, as it seems to us, throughout the book. It is quite fully given in typhoid fever, but there is no separate mention of the matter in the articles on the exanthemata, in which diseases it is of extreme importance to a family physician, especially in the first days, when it is sometimes as difficult as it is desirable to make a reliable diagnosis. A beginner would be helped scarcely at all by this author, to distinguish catarrhal pneumonia from croupous pneumonia, severe bronchitis, or pleurisy. Any one who has seen the rather ludicrous attempts of students and inexperienced practitioners to discriminate these affections will appreciate the needs of clear and complete instructions on the point. The same fault can be found, to a less extent, in the case of Tubercular Meningitis, one of the most deceptive and insidious diseases of children. He makes the following discrimination in the early stages in the description of tubercular meningitis: "in genuine meningeal inflammation, the muscles of the neck are contracted, and the head is thrown back." (Here he seems to have confused a marked symptom of epidemic cerebro-spinal meningitis with those belonging to tubercular meningitis.) "In states of simple irritation and passive effusion, the muscles of the neck are relaxed, and the child cannot support his head." These distinctions cannot be relied upon, and we have more than once seen the reverse, especially in the persistently and quite firmly retracted head of the hydrancephaloid condition.

The matter of treatment is quite fully entered into, and numerous formulæ are given in the body of the work and collected as an appendix, but "saline aperients, low diet and tartarated antimony" appear with somewhat ominous frequency, although, he adds, withal, warnings against their too free use. There is much loose and vague generality in many of the directions as to treatment, as well as some positively objectionable ones. In illustration, we find the following: "In acute disease, the remedies we employ are, as a rule (at least at an early stage), antiphlogistic and eliminative, such as venesection and the use of calomel and antimony." In cases of enuresis, "when a morbid salt is discovered, the administration of a drug which counteracts its formation often cures the patient." It is fair to add, though, that this statement occurs in a chapter of general instructions. Equally vague are the remarks upon prophylaxis of fevers. "Such measures are to be resorted to as support the constitutional powers and encourage the due per-

formance of the different functions of the body." Quite too definite, on the contrary, is the given *modus operandi* of perchloride of mercury, in diminishing albuminuria in nephritis, by facilitating "the escape of casts from the convoluted tubes." What proof there can be of such a mode of action we do not understand.

In the references to the electrical treatment, which are very unsatisfactory, we find that, in the case of chorea, he would apply "a gentle, constant current . . . to the suffering portion of the brain," which assumes that we know the brain is suffering, and the particular locality, and that the current can be applied thereto without trephining. In infantile paralysis, the important distinction between the faradic and galvanic currents in the treatment is unmentioned—a gross omission. In membranous croup, the indications for tracheotomy are "when all remedies have failed and death is near at hand"—the worst moment possible to choose for the operation; very similar rules apply to laryngeal diphtheria. Elsewhere, however, he dwells upon the more favorable chances, when it is not delayed too long. On the whole, his ideas upon the propriety, etc., of tracheotomy are commendable.

We have perforce thus far dwelt in a general way upon the negative aspects of the work, because our objection to it is, after all, mainly a fundamental one; that it is not a product of a scientific spirit and method. Notwithstanding the defects we complain of, there is much valuable matter to be found in the work, but it can be best extracted by one who already is tolerably conversant with the subjects treated.

His relation of matters of personal experience are of value, and there are several interesting histories of cases introduced, especially in those of intussusception and of suppuration of bronchial glands, with symptoms resembling a pulmonary cavity.

The descriptive headings before each chapter are an excellent feature. The book also is a readable one. The type is clear, but the paper is thin and poor.

S. M. ROBERTS.

A TREATISE ON THE DISEASES OF INFANCY AND CHILDHOOD. By J. LEWIS SMITH, M.D. Fifth edition, thoroughly revised. Philadelphia: Henry C. Lea's Son & Co., 1881, pp. 836.

It is perfectly evident, to even an ordinary observer, that infants and children are subject to a number of diseases peculiarly their own, and physicians have always recognized variations, when attacking children, in those affections common to all ages. Hence, the propriety of separate treatises and the success of the work now under consideration. Dr. Smith is a careful observer and painstaking writer. He has enjoyed unusual facilities which would enable him to write a practical and useful book, and that he has succeeded is attested by the appearance of successive editions of his work. Notwithstanding the type is smaller, this edition contains seventy-eight pages more than the last. Several diseases not alluded to in former issues are now treated of at length, and some chapters are entirely rewritten.

The first new matter which attracts our attention is the result of some experiments performed, at the suggestion of Dr. Smith, by the resident physicians of two of our large infant asylums, with the view to ascertain the necessary daily amount of food required by children at various ages. The author was prompted to determine these data on account of the ignorance, in this respect, of the experts testifying in a recent case in New York, where the super-

intendent of a charitable institution was sentenced to imprisonment on the charge of insufficiently feeding the children under his care. Very elaborate and patient attempts have been already made by several German physicians—notably Haehner and Ahlfeld (*Jahrbch. f. Kindhlkde.*, XV. B., 1 H.), abstracts of whose papers will be found in the October number of this JOURNAL, 1880, p. 982.

Dr. Smith gives five tables, the first two dealing with the ages from five days to ten months, and showing the age, number of nursings, and quantity of milk nursed during twenty-four hours, in fluid ounces and grains. The other tables illustrate the results obtained in children of two years to six years ten months.

Let us glance at the nurslings' table—ages five days to ten months. It would have been useful to have arranged the results progressively, according to age, instead of taking them as they happened to be experimented upon. As they now stand, one is obliged to make this order for himself. It is rather curious to observe the absence of what one would expect to see, namely, a gradual increase in the quantity of milk consumed. The same thing is apparent in Haehner's table, where the experiments upon his own child began at birth and extended over thirty-four consecutive weeks. While there is, of course, a marked increase throughout the entire period, yet several instances occur where there was a gradual and pronounced falling off, continuing two and three successive weeks; and there was less milk taken during the thirty-fourth week (1,100 grms.) than during the twenty-ninth (1,229 grms.).

The variation in capacity and voracity of the same child at different ages is thus accurately illustrated, and our author's tables show this equally well as pertaining to different children of the same age.

For instance, we find it recorded of three infants, aged five days, that they nursed during twenty-four hours, respectively, twenty-two, nine, and five ounces of milk. In fact, the value of this table, we think, consists in its revelation of these discrepancies. There seems to have been no uniformity with respect to age. A child of six months takes $12\frac{3}{4}$; another of six months, $25\frac{3}{4}$, and one of four months $36\frac{3}{4}$. One of seven months appropriates $26\frac{3}{4}$; while another of five months requires $29\frac{3}{4}$. The age, if we followed any individual illustration, gives us no clue within $10\frac{3}{4}$ as to how much milk should be allowed in a given instance.

Yet, in order to settle this point, Dr. Smith, taking twelve infants under five weeks, averages the number of nursings and the quantity of milk consumed. He says: "From these statistics, it is seen that each of these infants, who were all under the age of five weeks, and all but two under that of twenty days, nursed, in the average, 12.41 fluid ounces of breast milk in twenty-four hours, and, as the average number of nursings for each during the day was eleven, the quantity of milk received at each nursing averaged only a little more than one fluid ounce (1.12)."

If we are to proceed upon the basis that the requirements of all healthy infants from five days to five weeks of age are about the same, of course this method of calculation is sufficiently correct: but, in the first place, it seems to us that in view of the great difference, as shown by the table, in the amount of milk taken by those of the same age even; and secondly, on account of the limited number of individuals experimented upon (12) (certainly not

enough in face of the discrepancies alluded to) the conclusions are not very reliable. Would it not have been better to have taken a number of classes, each containing, say six individuals of the *same* age, and the age of each class differing progressively, below two months of age by two weeks, and above two months of age by one month? In the table headed "Ages; from Five Weeks to Ten Months," the recorded ages are from two months ten days to nine months.

The chapters on feeding and the general hygiene of infants are full and excellent. Accurate descriptions of the bodily functions of infants are given, thus rendering valuable aid in the way of diagnosis of perversion of those functions.

Rachitis is well treated; the recent views of German pathologists are noticed, in respect to the analogous effects produced in animals by the administration of lactic acid—dissolving the lime salts, and thus regarding the disease as due to the absence of the latter. But it is pretty generally agreed, we think, that, although by withholding lime from the food, or giving lactic acid by the mouth, we can diminish the proper proportion of this substance in the bones, and will have a osteo-malacic condition resulting, yet it does not follow that rickets is thus to be accounted for. We agree with our author that the absence of lime in the osseous system is rather to be accounted for by a perversion of nutrition in the bony tissues themselves, due, it may be, to inherited or acquired constitutional vices.

The chapters devoted to the exanthemata are well written, and diphtheria is allotted forty-six pages. The chapter on pleuritis is entirely rewritten, being, in fact, the same as recently appeared in this journal.

We have not space to go more fully into the details of this admirable book, further than to notice what the author says about the peculiar garlic odor often observed in the breath of patients taking large doses of bismuth. In answer to our inquiry on the subject, Dr. Squibb, the well-known pharmaceutical chemist and manufacturer, wrote us the following letter, which may be of general interest. Our curiosity in the matter was excited, because by deoxidation arsenic gives this odor, and knowing that many samples of bismuth contain arsenic in palpable amount, it was quite important to ascertain the true origin of the garlic odor; whether it were possible that, when associated with bismuth, arsenic could thus demonstrate its presence.

BROOKLYN, November 28th, 1881.

DEAR DOCTOR:—Yours of the 26th received. Quite a considerable proportion of patients who take bismuth salts will have garlic breath if closely observed—say at a guess, one case in ten—but perhaps one case in one hundred will have it so as to attract casual attention, and the same parcel of bismuth salt will cause the odor in some but not in others. As both arsenic and tellurium are present in metallic bismuth and both yield compounds with organic matter having this vile odor, it long ago became a very interesting problem to know which, or whether either was present in the bismuth salts which gave these results. I have never been able to find a trace of tellurium in any bismuth salts made by me, though I have repeatedly tested the very parcels which gave cacodyl odor. All bismuth salts sold by me are negative to Marsh's test for arsenic, and are strictly officinal, and yet by more critical examination than Marsh, they are found to contain arsenic in the proportion never

exceeding small part. And no such proportion as this can be naturally supposed to give any perceptible results of any kind. It is fair to say that the chemical tests for tellurium known and used by me are not nearly so delicate as are those for arsenic, and yet I believe I could detect any proportion which would be at all likely to yield the results in question. Other better chemists than I am have also searched in vain for tellurium in bismuth preparations, which have undoubtedly given the garlicky breath.

Thus you see that, while it is reasonably certain that bismuth preparations do give this result, they give it only occasionally, and it is equally certain that bismuth preparations which do give this result are practically free from both arsenic and tellurium, and lastly that these two metals are the only ones known to yield compounds giving this peculiar odor. Very truly yours,

E. R. SQUIBB.

The work is printed in the best style and is tastefully bound.

There is no doubt but that it will long retain its place as a standard text-book among students and practitioners.

GEO. B. FOWLER.

FROZEN SECTIONS OF A CHILD. By THOMAS DWIGHT, M.D., Instructor in Topographical Anatomy and Histology in Harvard University, pp. 66, New York: Wm. Wood & Co., 1881.

A specimen chapter and illustration of this work appeared in this journal in July last, and fairly represent the character of the book. Dr. Dwight was prompted to publish his drawings and descriptions, believing that the topographical anatomy of children, at about three years of age, presents certain important peculiarities which have not hitherto been similarly or equally well demonstrated. There are fifteen sections, made on the horizontal plane, beginning at the base of the neck, and extending in successive levels to below the symphysis pubis; the slices being about two centimetres thick.

The drawings are life-size, very distinct, and instructive. The principal organs are plainly indicated, our author wisely abstaining from overwhelming his plates with labels, as is frequently done, with the effect to produce a conglomeration of anatomy and literature, utterly confusing and practically useless. It is a great mistake, in teaching, to attempt to show everything in one diagram or drawing.

The author, while regarding frozen sections as of much utility in the study of anatomy, at the same time frankly admits their shortcomings. These are principally the obscurity of small organs and parts with thin edges, such as minute vessels, not injected, nerves, and fasciæ. Yet one is surprised to find how instructive the plates are when diligently examined. We are most familiar with the relations of parts as shown in vertical sections, but these cuts seem to supply a deficiency, by giving us a more accurate idea of the complete surroundings of the parts.

The text is explicit, and calls attention to many anatomical variations peculiar to the age of the cadaver. We can but commend the author for his zeal and skill, and the publishers for the elegance of the print and material of the volume.

G. B. F.

ABSTRACTS.

Prepared by J. FEWSMITH, JR., M.D., Newark, N. J.

1. Fraser: The Bath Treatment in Scarlet Fever.—DR. D. MANSON FRASER (*Practitioner*, July, 1881), in order to test the effects of baths in scarlet fever, subjected twenty-one patients to this treatment, in the Metropolitan Fever Hospital, Homerton. He began in November, 1880, and continued it until the end of the year, the epidemic being on the decline. The baths used he roughly divides into three classes:—(1) warm baths, temperature between 90° and 80° F.; (2) Ziemssen baths, those gradually cooled during immersion of the patient; and (3) cold baths, of a temperature of from 70° to 60° F. The duration in all cases was five or ten minutes. Stimulants were occasionally administered to prevent collapse. As to the indications, while not depending altogether on the degree of fever, Dr. Fraser always administered the bath if this was excessive, 103°–104° in rectum, or if there was a persistent temperature of 102°–103°, with consequent nervous disturbance. The author thinks we can prevent the nervous prostration, which is sure to follow protracted fever, by the timely administration of baths. He also recognizes the fact that we may have the nervous excitement without the antecedent or concomitant high fever, or vice versa, and considers baths adapted to such a condition. Where members of the same family have suffered severely, it is a good plan to begin early with the baths, before grave symptoms develop.

The contra-indications are feeble circulation, and where great fear and excitement attend the immersion.

The effects of the bath are classified under the heads of (1) effects on temperature, (2) effects on the nervous system, (3) effects on the circulation, (4) on respiration, (5) on skin, etc., (6) effects on sequelæ.

The *temperature* invariably fell after the bath. After a warm bath the fall equalled 3° or 4° F., but it regained its former height in an hour. After a cold bath the thermometer often showed a decline of 7°, and the previous temperature did not return until from three to six hours.

After baths which were cooled during the immersion of the patient, the fall was 4° or more, and if the duration was short, the former temperature rapidly re-established itself. But if the immersion was prolonged after cooling, making virtually a cold bath, the effect was more pronounced and lasting. Yet here the fall was not equal to that in the bath which was cold at the beginning, showing, apparently, that in the latter case the nervous shock plays a part.

The *nervous system* was always calmed. In all but one case, delirium, restlessness, and insomnia ceased. The *circulation* appeared to be depressed during immersion, but afterwards resumed its former character. As regards respiration, there was no marked effect upon its frequency. The treatment did, however, in many cases allay cough. In no instance did it originate pulmonary mischief.

The effects on the *skin, etc.*, were variable. In some cases the eruption was increased, as Trousseau has said. Desquamation was not modified. Thirst, as noted by Currie, was diminished, but diarrhea was not apparently influenced. The *sequelæ* and *mortality* are shown in the following table.

The most common sequelæ of scarlet fever are adenitis of the neck, otorrhea, and albuminuria. This table shows three cases of adenitis; one only was severe, and none suppurated. Otorrhea, one very mild case.

Four patients had albuminuria (about one-fifth); Trousseau says one-third have this sequela.

Ten, or about fifty per cent of all the cases, suffered from a sequela, which fact Dr. Fraser regards as favorable, considering the severity of the attacks, and says that the percentage is not larger than occurs after other methods of treatment.

The mortality was two per cent. For the whole year, 1880, the mortality in scarlet fever at Homerton was eleven per cent.

The baths were all given during the acute stages of the fever, and varied in frequency from one to six in twenty-four hours:

CASES.	AGE.	TEMPERATURE AND DURATION OF BATH.	SEQUELÆ.	RESULTS.
1	13	90° F. for five minutes.	None.	Recovered.
2	12	90° " " "	Aphasia, paralysis.	* " "
3	2½	85° " " "	None.	Recovered.
4	16	90° " " "	" "	" "
5	3	{ 90° cooled to 70° for five minutes.	Pulmonary cong't'n.	Died.
6	5	{ 80°-60° for 5 minutes.	{ None.	Recovered.
7	4	{ 80°-60° " 10 "	{ Albuminuria.	" "
8	5	{ 70°-60° " 5 "	{ Adenitis.	" "
9	4	{ 70° for 5 minutes.	{ Albuminuria.	" "
10	14	70° " 8 "	{ Rheumatism.	" "
11	12	70° " 5 "	None.	" "
12	5	70° " 5 "	Brachial monoplegia.	" "
13	9	70° " 10 "	None.	" "
14	3	65° " 5 "	Albuminuria.	" "
15	10	65° " 5 "	None.	" "
16	7	65° " 5 "	{ Albuminuria.	" "
17	7	65° " 5 "	{ Adenitis.	" "
18	4	65° " 5 "	{ Otorrhea.	" "
19	6	65° " 5 "	None.	" "
20	16	65° " 10 "	Adenitis, jaundice.	Died.
21	7	65° " 5 "	None.	Recovered.
			Albuminuria.	" "
			Bile in urine.	" "

* Discharged in May, 1881, much improved, but still with great degree of paralysis.

G. B. F.

2. Baader: The Specific Nature of Varicella (*Correspondenzbl. f. Schweizer Aerzte*, 1881).—A. BAADER defends the opinion that the poison of varicella is specific and entirely distinct from that of variola on the following grounds. He declares that "pocks," whether slight or marked, never arise from the infection of varicella. In Basle, from January 1st, 1875, to September, 1879, 584 cases of varicella were reported, and only 21 cases of variola—a number out of all proportion to the varicella cases. During this whole time there was no epidemic of variola, though the varicella patients, with the usual carelessness, were allowed to mingle freely with those about them. In the few cases of variola which occurred, infection could be traced to outside sources. In the township there are observations recorded of various epidemics of

varicella among an unvaccinated people without variola arising from them. Anatomically, the difference is that the pock usually consists of a papule, the varicella of a scarcely raised and very slightly infiltrated macule. The latter become vesicles and, occasionally, pustules. Clear vesicles are rarely seen in variola. While variola, as is known, attacks all ages, it was seen that in Basle, out of 584 cases of varicella, 93 were under 1 year, 70 from 1 to 3 years, 219 from 2 to 5 years, 191 from 5 to 10 years, 7 from 10 to 15 years, 2 from 15 to 20 years, 2 from 20 to 40 years. That is, 573 before the 10th year, and only 11 from 10 to 40 years; so that such an eruption occurring after the 20th year at once arouses suspicion of varioloid. There are no cases recorded of *congenital* varicella. The fever of eruption characteristic of variola is wanting in varicella, the rise of temperature not coming till *after* the eruption of the vesicles.

3. Tschamer: The Contagium of Variola, Vaccine, and Varicella (*Archiv f. Kinderheilk.*, II. B., 3 H.).—DR. A. TSCHAMER promises a great deal, not only to show that these three diseases arise from fungous growths, but to “place in complete clearness the nature of the diseases and their changeable relations.” In all three he found the contagium not only in the pustules and scabs, but also in blood and urine. Without going into his methods of fungus culture or venturing any opinion as to the scientific correctness of his methods, we may at least, admitting his results, consider ourselves competent to judge whether he is justified in drawing from them the decided conclusions he does. The conclusions are probably correct. They tally with all clinical observations; but we cannot see that they are at all proven by Tschamer’s experiments. He has decided that varicella is a disease *sui generis*; variola and vaccine contagium are identical, arising from the same fungus. Vaccinia is only a milder form of variola, made milder by the passing of the poison through an organism. Vaccine, therefore, protects from variola. Now for his experimental proofs:—

1. Variola and vaccinia show the same microscopical appearances (*penicillium olinaceum*, Corda).

2. The culture of the varicella micrococci leads to a new and hitherto unknown fungus.

3. The internal administration of fungi bred from the variola micrococci:—(a) In a chicken—on the eleventh and twelfth days, malaise, but *no exanthema*. The blood showed fungi, from which variola fungi could be raised, from the second day on for three weeks.

(b) Another chicken—fungus cultivated from vaccine, then dried and powdered, was allowed to stand twenty-four hours in distilled water, and then inoculated in four places on the thighs. In the first ten days, no result except micrococci in the blood. On the eleventh day, loss of appetite, and on one eyelid a little pimple which became vesicular, and then pustular, and which contained the *same fungous elements* as a variola pustule. The scab also was like a variola scab. Further inoculations were not made from this pustule.

(c) The same method of inoculation on four other chickens. No result except that for four weeks the blood contained elements which could be cultivated to variola fungi. These cultivated fungi were not used for further inoculation.

(d) No experiments were made with the varicella fungus, for “The

fact sufficed me (Tschamer) that it was a different fungus from that of *variola*."

Tschamer had also the good fortune to find the *penicillium olini* (Corda) on the dried needles of pine and fir trees. He cultivated it scientifically, and inoculated with it four chickens and nine rabbits. It gave rise to no exanthema, the chickens did not die; but the blood was just like that of the chickens inoculated with *variola* fungi. He then inoculated himself in seven places on the left arm with the cultivation-fluid of the fungoid elements from the blood of the chickens. Result—at one point a small pimple, later a *vesicle visible only with a magnifying glass*; then a little scab which stayed on for fifteen days. This scab was microscopically identical with the scab of *variola* or *vaccinia*. For fourteen days the blood and urine held elements which could be cultivated as above. In regard to the result on the rabbits, we must not omit to mention that *on one, on the 13th day, there was a little vesicle at the point of inoculation*—blood, urine, scab, etc., as above.

So much for Tschamer's experimental results.

4. Palmer: Pemphigus (*Würtemb. med. Corr.-Bl.*, 40, 1880).—DR. PALMER, in the past year, saw five cases of pemphigus following rapidly one upon the other.

(1.) A boy fifteen days old, perfectly healthy, certainly not syphilitic, showed at first a few pemphigus vesicles. These then, in two weeks, spread rapidly over the whole body. The eruption was accompanied by great loss of strength, occasioned by the vomiting and diarrhoea, and the boy died on the thirty-fourth day of life.

(2.) Six days after this, a four-days-old, non-syphilitic child, cared for by the *same midwife*, became sick, and died in three days under dyspeptic symptoms.

(3.) Nine days later, another child, three days old, and in the care of the same midwife, sickened with an extensive pemphigus. Death followed in thirteen days from stomach and intestinal disturbance.

(4.) Nine days later, a fourth child, in care of the same woman, sickened and died in twelve days with the same symptoms. From this child the mother was infected. Vesicles appeared on her hands, but they soon healed without much constitutional disturbance.

No child cared for by any other midwife was sick during this time in Biberach.

5. Baginsky: Pneumonitis in Children (*Analekt. des Jahrbch. f. Kinderhilkende.*).—DR. A. BAGINSKY expresses the opinion that in a certain number of cases we can certainly diagnosticate croupous from catarrhal pneumonia, but that, on the other hand, cases occur in which neither the clinical practitioner nor the pathologist is able to make the differentiation with certainty. Of 255 pneumonias, 60 were purely croupous, 162 surely catarrhal, and 33 belonged to the latter group mentioned above. The description which B. gives of croupous and catarrhal pneumonia is the well-known clinical picture of the disease. The mixed forms at first simulate the croupous variety, but later they do not come to a critical resolution, but lobar and lobular infiltrations develop, with moderate fever, and the prognosis grows worse day by day. We omit B.'s accounts of the pulse, respiration, and temperature. He opposes the opinion of Jürgensen that pneumonia causes death through insufficiency

of the heart brought on by the high fever, and from a pediatric standpoint claims that, in children at least, death is due to insufficiency of respiration. According to Benecke's researches, the volume of the heart in early childhood stands to the size of the aorta descends in the ratio of 25 : 20, at puberty as 140 : 50, and in adults as 290 : 61. For each 100 cm. of length of body the heart of the child has 40-50, the heart of the adult 150-190 cm. volume. That is to say, that in the systemic circulation of the child the pressure is very much less than in that of the adult. On the other hand, in the child the art. pulm. is comparatively wide, and the aorta descend. comparatively narrow, while in adults they are of about the same size. At the close of the first year, the size of the pulmonalis and aorta is for every 100 cm. of length, as 46 : 40, in adults as 3.59 : 3.62, and in old age as 38.2 : 40.4; that is to say, that in the pulmonic circulation of the child the pressure is relatively much higher than in the adult.

Now, Jürgensen claims that in pneumonia the exudation increases the resistance in the pulmonic circulation, and therefore gives the right heart more severe work, especially as the decrease of aërating surface for the blood at the same time demands greater accomplishments from the forcing power; that is to say, in pneumonia the pressure in the systemic circulation is decreased, while that in the pulmonic is increased.

This condition of affairs is *in adults* opposed to the anatomical design, and changes the normal type of respiration. *In children*, however, it agrees with the anatomical conditions. The right heart of the child is much more capable than that of the adult, and the danger of heart insufficiency much less. On the other hand, the normal exchange of gases in the child is greater, while its muscles of respiration are weaker than in the adult. The pneumonic child, therefore, finds in the respiration the insufficiency which it escaped in the circulation.

In regard to the treatment of pneumonia in children, Baginsky warns against the use of cold baths, because they cause contraction of the small arteries and increase of the pressure in the aortic system, and thereby create for the child an unfavorable condition which does not belong to its age. He recommends temperate (22-25° R.) baths. He also believes that in some cases the advance of the infiltration may be checked by the application of cupping-glasses.

In the discussion which followed, Kormann spoke in favor of cold-water treatment in the form of cold packings.

Benecke remarked that, not only after pneumonia, but after typhus the autopsies had shown congenital narrowing of the arteries and death from cardiac insufficiency, and recommended that we should do away with the extreme fear we now have of blood-letting.

6. Steinmayer: Successful Tracheotomy in a Child of Seven Weeks (*Berl. klin. Wochschft.*, 1880).—DR. H. STEINMAYER performed tracheotomy on a child seven weeks old. The mother was consumptive. The child was very much emaciated from numerous abscesses of the cellular tissue. It was suffering intense dyspnea, probably caused by an abscess over the cartilago thyroidea. It took an hour to perform the operation, on account of the narrowness of the trachea and the difficulty of getting the smallest canula inserted. As soon as the canula was in, the dyspnea ceased entirely. Nine days after the operation the abscess

over the thyroid cartilage was opened. On the fourteenth day the canula was removed, and on the twenty-second day the child was well.

7. Ranke-Oertel: The Etiology of Diphtheria (*Aerztl. Intelligenzbl.* 1880 u. 1881).—The *Jahrbuch* contains an interesting report of articles by DR. H. RANKE and PROF. OERTEL, and the discussions which took place over them. As there is so much interest in this subject at the present time, we may glance at their views, even at the risk of some repetition.

Prof. Dr. Oertel holds his own views on some particular points. He includes under the name diphtheria only the true epidemic diphtheria, an infectious disease *sui generis*, and leaves out of view the so-called secondary forms of diphtheria. He declares himself as always of the opinion that diphtheria is a *primarily local* disease caused by fungus vegetation, and not, as Buhl teaches, a general disease caused by infection, and which only secondarily becomes localized in mouth and throat. He thinks that it depends principally on the anatomical condition of the part first affected, its light penetrability and its power of resorption, to determine in what time the contagium, radiating and constantly advancing, shall course through the body, and cause the general infectious disease. The degree of the infection depends on the quantity and virulence of the infectious material. Statistics show that children are particularly disposed to diphtheria, under one year less than from two to four years, and these again less than from four to ten years. The older the child, the more rarely is the membrane of the larynx, trachea, bronchi, or nasal cavity affected. The disposition is increased by bad outward circumstances, clothing, food, hygiene.

There are families in which there is an inherited, constitutional tendency to diphtheria, showing itself in a peculiar tendency to catarrhs and phlegmonous inflammation of the commonly affected points, and also increasing greatly the intensity of the diphtheria. The disposition to catarrhal and diphtheritic diseases depends on the same peculiarities of the membranes, and all the unfavorable moments which give rise to catarrh also ground the *acquired* disposition to diphtheria. There are, on the other hand, individuals who possess an immunity from diphtheria, and others who possess immunity from disease of the membrane of the nose and mouth, but an increased disposition to the disease in the membrane of larynx, trachea, or bronchi. The greatest number of cases occur in cold, wet, damp, stormy months. Comparative statistics seem to show that in northern Europe diphtheria of the larynx, trachea, and bronchi occurs as often or oftener than that of the throat, while in the south the reverse is true. Yet neither heat nor cold, neither dryness nor wet are absolutely preventive of the spread of an epidemic of diphtheria. Under the influence of septic miasms, such as hospital gangrene, putrid fever, typhus, etc., diphtheria often reaches its most extensive and intense epidemic character. There can be no question that diphtheria is decidedly contagious. In general, the virulence of the contagium is the greater the more severe the case from which it is derived, but in some cases it depends on the individual disposition of the affected person. The contagium has a comparatively slight tendency to spread, but great *tenacity*, as shown by the way the disease sticks to houses and places. Oertel has discussed in full in another article the relation of the disease to the micrococcus diphtheriæ. As above stated, he believes all the gen-

eral and septic symptoms to arise from the local process (the point of infection) by the radiating extension of the minute organisms in the tissues. The fungus of diphtheria is not to be distinguished by any means in our power from other similar, sometimes larger and sometimes smaller elements which may be found under various circumstances and in various media. The only point is, that when seen in quantity it has a brownish color which has not been shown in any other fungi. It is only in the *vital* qualities of the diphtheritic fungus that we find points which determine us to recognize in it a *decided* difference from other fungi. In their growth they force away, choke other fungi, and these do not again appear till the former are destroyed, and it is only inoculations with the diphtheria fungus that are greatly deleterious. It cannot, therefore, be positively denied that other fungi, by peculiar processes of vegetation, may be changed from harmless to infectious. The relation between disposition and excitant is to be sought in such a condition of the membrane as shall not only greatly favor the growth of the fungus, but also in which the power of resistance of the tissue elements and the capability of reaction in the tissues is lessened. The processes of fermentation and destruction caused by the fungus produce poisonous materials which give rise to the dreaded pathological changes. The facts which have been adduced to prove the spontaneous origin of diphtheria are to be explained either by saying that the fungus has remained in one place until, under circumstances favorable to its growth, it has suddenly again become a disease excitant, or that it has remained in the body a much longer time than the usual period of incubation, and only then aroused the disease when some depressing cause has developed the disposition in the individual. The period of incubation varies with the virulence of the contagion, the disposition of the individual, and the condition of the tissues. In experimental inoculation it was twenty-two to twenty-four hours; in excoriations, wounds, etc., about forty-eight hours, and in cases of transmission upon the mucous membrane from two to five, or, at most, twelve to fourteen days.

So much from so high an authority as Oertel.

DR. H. RANKE began his article by discussing the question of whether there was in Munich a form of membranous laryngitis which was not of diphtheritic origin. He asserted that in all cases where he had examined carefully enough, even when apparently all the circumstances spoke for the existence of a *genuine croup*, he at length established with certainty a connection with diphtheritic infection. He criticises carefully the discussions in the Royal Medical and Surgical Society, and like their committee answers the question as to whether diphtheria may arise spontaneously with a *decided yes*. The presence or absence of micrococci and albumen gives no certain differential criterion for genuine croup and diphtheritic croup. The swelling of the cervical glands is also an uncertain sign. The paralytic symptoms in the larynx are also sometimes found when there has been no pharynx diphtheria, perhaps also in cases where we should feel justified in diagnosing genuine croup. The mortality of non-tracheotomized cases of membranous laryngitis is about the same with or without pharynx diphtheria. On the contrary, the mortality in tracheotomies is much higher when the cases are complicated with pharynx diphtheria than when they are not. Dr. R. does not deduce

from this a difference in the processes, but explains it by the different behavior toward the diphtheritic poison of the different areas of membrane. It is a settled fact that the laryngo-tracheal diphtheria is less contagious, but even this gives no valuable differentiating mark between genuine and diphtheritic croup. At present there are no cases where it is positive that membranous laryngitis has originated from cold, etc., without any aid from the diphtheritic poison. Some have been observed from injuries, caustics, or burns. Experience has, therefore, not shown that catarrhal laryngitis has afterward become infected with the diphtheritic poison.

In the discussion which followed, Oertel claimed that Ranke had not proved that diphtheria could arise spontaneously or that non-diphtheritic membranous laryngitis existed. The other opinions were divided, but on the whole rather supported Oertel in most of his statements.

8. Totenhöfer: Resorcine in Cholera Infantum (*Breslauer ärztl. Zeitschft.*, 24, 1881).—DR. TOTENHÖFER, at the suggestion of Dr. Soltmann, instituted therapeutical experiments on the above subject. It was well known that resorcine had a powerful antifermentative and disinfectant action, and Dr. Soltmann thought on that account it might be useful in these cases. He divides cholera infantum into three principal forms: first, a consequence of acute or chronic intestinal catarrh, preceded for some time by many disturbances and treated by stimulants, astringents, and opium.

The second form, depending on putrefaction and fermentation of the food, especially the milk, in the digestive canal, is an intestinal mycosis and must be treated anti-mycotically.

The third form depends on septic processes, originating from local factors of disease—such as develop in badly ventilated or overcrowded dwellings.

In the hospital, ninety-one children were treated with resorcine. Twenty-four of them were under three months old, fifteen were from three to six months, fifteen from six to nine, thirteen from nine to twelve, and twenty-four over one year. Of these ninety-one cases, seventy-seven recovered. This rate of mortality of only 15.4%, when compared with a mortality of 39.4% in 1878 and 30.7% in 1879, and of 20% under the treatment by benzoate of soda, speaks very favorably for resorcine.

Resorcine very promptly stops the vomiting, does not cause collapse or even increase it when already existing, diminishes the number of stools, does not work by cauterizing, like carbolic acid, is never poisonous in the necessary doses, is willingly taken and well borne, without any corrigent, and creates a rapid resorption power in stomach and intestines, even for dilute milk in small but frequent quantities. To children in the early months 0.1—0.3 of pure resorcine in 60.0 of infus. chamomile was given. In cases of collapse, injections of ether were used and for symptoms of peritoneal irritation, after the collapse was over, tincture of opium.

9. Kobert: Poisoning from Chlorate of Potash (*Abs. of Jahrbch.*, XVII. B., 2 u. 3 H.).—This subject is of so great importance and interest at present, when this drug is so frequently and so largely used, that it may be well to collect a few articles upon it together.

DR. KOBERT, in an excellent paper in the *Smidtschen Jahrbuch*, presents

the data of the pharmacological and toxicological action of chlorate of potash as most recently observed, both clinically and experimentally.

Hector Chaussieu (1819) is said to have first used the drug in diphtheritis and croup, but it was not till forty years later that its use became general. Isambert, who was very instrumental in bringing it to notice, also gives the best data concerning its absorption and elimination, the latter taking place principally through the urine and the saliva. The method of showing this is by adding a little indigo and sulphate of potash to the suspected fluid. Chloride of potash is formed and the freed oxygen oxidizes the indigo and gives a yellow or green color. Dr. Felix Marchand (Halle) was the first to make careful examination into the poisonous effects of the drug, his attention being aroused by the case of a boy of six years who, when recovering from a slight diphtheritis, was taken with vomiting and rapidly died, with some slight convulsive symptoms. At the autopsy the blood was found to be of a peculiar, chocolate-brown color, and the kidneys swollen and grayish-brown. The child had been treated with chlorate of potash. Following this, Dr. Marchand observed four other cases, three in children, which presented the same symptoms as are experimentally caused by poisoning with this drug. Fresh animal blood when mixed with a solution of chlorate of potash, after a few hours becomes dark-brown, as thick as syrup and finally gelatinous. The blood-corpuscles still remaining are pale and sticky, clinging together in irregular clumps, and may be preserved for weeks without becoming putrid.

If dogs are fed on chlorate of potash, the same changes occur in the blood. They depend on destruction of the hemoglobin and solution of the corpuscles. Secondly, in the animals experimented on, occurred changes in the lungs, the spleen, and the kidneys. In the latter, the urinary tubules were filled with transparent, homogeneous, brownish casts and cylindrical masses formed by the fusing together of blood-corpuscles. The urine, during life, showed large numbers of brown casts and granules. The whole process seemed identical with the oxidation of the hemoglobin described by Hoppe-Seyler (methemoglobinuria.)

This discovery was the more surprising, because it had previously been supposed that chlorate of potash was eliminated unchanged, while now we must consider that it is reduced to a chloride and the blood oxidized by the oxygen set free. The tendency of the blood to gelatinize and become glutinous under this influence gives rise to circulatory disturbances, especially in the spleen and kidneys. Dr. Marchand studied the changes in the kidneys of the animals he experimented on step by step through all the different stages. The condition of the blood resembles closely that found in the disease of the new-born described by Winkel, though he called it a hemoglobinuria, while in the cases of chlorate of potash poisoning the blood never gave the spectrum of hemoglobine.

Jacobi, as is known, has often warned against the use of large doses of chlorate of potash as causing hemorrhagic nephritis. In other cases, the intoxication is evidenced, not through kidney symptoms, but by gastro-enteritis.

Most recently Dr. Walter Brandstätter (Inaugural Dissertation, Berlin, 1880) published a case of a woman twenty-eight years old, the autopsy upon whom substantiated the statements of Dr. Marchand. In this case also, the dissolution of the blood was strongly shown by the condition of

the urine during life, the regular brown coloring of the organs in the corpse, the occurrence of peculiar blue spots upon the skin, an apparently hepatogenous icterus, characteristic discoloration of the marrow of the bones, and the above-described changes in the kidneys.

DR J. HOFMEIER (*Deutsch. Med. Wochenschrift.*) adds another case, that of a woman who had in one and half days used 40.0 of the salt. The symptoms of intoxication were frequent respiration, frequent pulse, elevated temperature, dark-brown icterus, discoloration of the cheeks not disappearing on pressure, and voiding of a cloudy, dark-black urine which contained degenerated blood-corpuscles and yellow or brownish amorphous flakes. The urine showed a distinct methemoglobine spectrum. The blood obtained by puncture was almost black, microscopically normal. That obtained from the pale cheeks was a reddish, serous fluid with few corpuscles. Death occurred in twenty-four hours from edema of the lungs. At the autopsy, both kidneys were found enlarged, of light chocolate color, and on section peculiarly brown. The straight and convoluted tubes were filled with intensely reddish-brown casts which consisted of fragments of red blood-corpuscles. The spleen and the marrow of the bones were also reddish-brown. Dr. Hofmeier mentions three other cases which had come to his knowledge and proposes transfusion as a method of treatment.

DR. KONRAD KÜSTER (*Berl. klin. W.*) discusses some cases which have been reported as cases of acute intoxication from chlorate of potash and regards them rather as cases of blood poisoning from diphtheritis. He says in differentiation that the poisoning from the drug runs its course with unconquerable, continuous vomiting, strangling pain in the stomach and oesophagus, bloody urine, regular, strong pulse, and no fever. General diphtheritic intoxication, on the other hand, begins with vomiting and diarrhea; like other acute infections, but soon icterus, hematuria, and especially collapse become prominent. He states, however, that it may now be considered certain that chlorate of potash in *large doses* may have a poisonous effect.

10. Rossbach: Papayotine, a good Solvent for Diphtheritic and Croup Membrane (*Berl. klin. W.*, 10, 1881).—J. W. ROSSBACH reports the results of some experiments which he has made with papayotine with regard to its solvent power upon croup membranes. Pure papayotine is amorphous, clear white, without smell and almost without taste, soluble in twenty parts of water, and indifferent toward normal membrane. Normal lung-tissue in a five-per-cent solution of papayotine remains unchanged for several days, while muscle, on the other hand, becomes very rapidly completely disintegrated. In the same solution, croup membranes disintegrated, even after one hour, into very fine particles, and after six hours were completely dissolved. A two-per-cent solution worked much more slowly, a one-per-cent solution not at all. Experiments within the *succus caricæ papayæ* gave much poorer results. Rossbach reports some of his experiments upon children with diphtheritic croup, who were treated with the less active *succus papayæ*, but he does not regard the experiments as decisive.

11. Binz: The Use and Preparation of Tannate of Quinine (*Berl. klin. W.*, 9, 1881).—In 1868, C. BINZ recommended in this magazine the

use of quinine in pertussis, in doses daily of twice as many decigrammes as the child's age.

Becker and Hagenbach substitute for the sulphate of quinine the tannate, in double doses, and have obtained the same good actions from it, but Binz found that the tannate of quinine contained at one time only ten per cent, at another time twenty-five per cent of the active alkaloid, and further that the preparation was rendered unnecessarily dear by the customary course of precipitating from a neutral solution of muriate of quinine with tannate of ammonia and washing out of the precipitate. He suggests the use of chinoidine precipitated by tannic acid from the solution obtained in the preparation of quinine. We thus obtain the only slightly bitter-tasting chininum amorphum tannicum neutrale, which C. Zimmer in Frankfort sells for thirty francs per pound. Binz also, in contradiction to Rossbach, defends the opinion that the action of the quinine does not depend upon its decreasing the reflex irritability of the spinal cord, but much rather that it acts by its direct influence upon the cause of the disease, be this an organized or unorganized ferment.

PROF. E. HAGENBACH (*Correspondenzbl. f. Schw. Aerzte*, 1881), after reviewing the various and often contradictory opinions concerning the pathology and the therefrom deduced treatment of pertussis, gives his own experience with different remedies. Foremost in the treatment of pertussis, according to his experience, stands quinine. Insufflations of quinine into the larynx, when correctly carried out by the physician, frequently, though not without exceptions, give most satisfactory results, but the general use of this method is prevented by its unpleasantness.

But quinine proves itself useful also internally. Chloral, bromide of potash, sprays of carbolic acid, and inhalations of salicylic acid have never, in Hagenbach's experience, proved as useful as quinine. He has also obtained excellent results from the neutral amorphous tannate of quinine, prepared by C. Zimmer in Frankfort. This is quite rapidly absorbed by the stomach, and still more so if followed by an alcoholic draught. Probably it is absorbed as a muriate of quinine (Becker). On account of its slight percentage of the alkaloid, we must give two or more times a day as many decigrammes as the age of the child. Hagenbach has treated ten cases of pertussis with this preparation, and confirms the statement of Becker that it ameliorates the paroxysms, shortens the duration of the disease, increases the appetite, decreases the vomiting, and has only the one disadvantage of inducing constipation. In some cases, Hagenbach claims that he has suppressed the disease in the stadium catarrhale.

He has used the drug as an antipyretic in about a hundred cases, and gave it either in single doses or in two doses, a half-hour apart, of 1.0 to children from 0-1 year; 1.5-2.0 to children from 1-3 years; 2.0 to children from 3-5 years; 3.0-4.0 to children from 5-10 years; and 4.0 to children from 10-15 years. He thinks also that larger doses might be given without disadvantage, followed by an alcoholic draught. The remedy has a decidedly antipyretic action, the remissions occur less frequently, though they continue longer than under the treatment with sulphate of quinine or salicylate of soda. It causes less deafness and tinnitus, never occasions nervous irritation and collapse, aids digestion, and has no unpleasant effect. In severe cases, the desired rapid effect is perhaps not reached, and then it is well to combine the remedy with salicylate of

of soda, giving the tannate of quinine in the morning, and the salicylate of soda in the evening.

12 Marx: Relation of Catarrhal Diphtheritis to Severer Forms (*Zeitschrift. f. klin. Med.*, 27 B, 1 u. 2 H.).—DR. JOS. MARX defines catarrhal diphtheria as a process in which there are only superficial and circumscribed deposits upon the membrane, while in the substance of the membrane there is only a catarrhal affection. He explains further that this catarrhal diphtheria is identical with the simple, circumscribed form, and he contrasts it with diphtheritic catarrh in which there are no deposits whatever upon the membrane. The disease begins without fever, or with very little, and with only slight general disturbances which all disappear within twelve to twenty four hours. After a few hours, points of superficial and narrowly circumscribed deposit appear. These have but little tendency to spread or become thicker, and in a few (3-4) days they loosen and come away. This form may change into a severe one in that, after an easy course for a few days, on about the fourth day, the symptoms of well-marked croupous throat diphtheria develop. The extension to the larynx may even take place at a time when the most prominent symptoms of the angina diphtheritica have disappeared. The diphtheritic character of catarrhal diphtheria is shown, not only by its well known transmissibility upon other persons, but also by well-proven examples of its origin by contagion from marked cases of diphtheria. Through infection from catarrhal diphtheria the severest forms of diphtheritis may arise. In place of the whitish-gray deposit, under which the membrane appears only catarrhally affected, there develop masses of micrococci, the deeper epithelial layers become swollen, and show enlarged and sharply contoured nuclei; masses of micrococci are also found in irregular heaps on the surface of the epithelium, pus-corpuscles develop within twenty-four hours—in short, the only thing wanting to form true diphtheritis is the extravasation of fibrinous material.

13. Baumgarten: Relation of Murrain and Tuberculosis (*Berl. klin. Wochenschrift.*).—DR. BAUMGARTEN presents observations which he considers to place in a clearer light than preceding works on the subject the relation of murrain (garget) and tuberculosis. Through a great many autopsies he shows that genuine spontaneous tuberculosis occurs in rabbits, though rarely, and that they do not show the least disposition to become tuberculous from experimental inoculation—even when this is followed by caseous suppuration. He has never been able to prove a causal connection in any animal between cheesy pus and tuberculosis. All attempts at inoculation, either in subcutaneous tissue, peritoneal cavity or eye, with tubercular substances from the human body were without result.

On the other hand, inoculation in the eye with pieces of lung from calves suffering from murrain gave first a local, and in a few months a general tuberculosis with *mathematical certainty*. If the tuberculous eye is enucleated early enough, before surrounding glands are involved, the animal remains healthy. That there is a *specific virus* in this murrain substance, he shows by a large number of experiments with inoculation of other matters, pus, caseous matter, cancer, etc., not one of which was followed by tuberculosis. Only tubercle and tuberculous masses

from human bodies, when very fresh, can accomplish the same as the murrain substance.

14. Behrend: Concerning Hereditary Transmission of Syphilis (*Berl. klin. Wochenschrift.*, 8 u. 9, 1881).—DR. G. BEHREND claims that it is an established fact that syphilitic placental infection may take place; that is, that the syphilitic contagion may pass from mother to child or from child to mother by means of the placental circulation. He presents the following two cases:

1. A woman twenty-four years old, in the ninth month of her first pregnancy, presented "a number of intact, broad condylomata on the labia majora, a superficial and already disappearing induration of small size on the edge of the left labium minus, a beginning roseola on the body, a small number of little scabs in the head, slight swelling of the superficial lymph-glands, especially the inguinal, and pharyngitis catarrhalis." According to this, Dr. B. considers it certain that the termination of the infection was in the second half of the pregnancy. Under energetic inunction all these symptoms disappeared. Twenty-six days after the first examination, a full-term child was born, pale, very fat, but free from syphilis. When three weeks old, it had broad condylomata about the anus. When sixteen months old, it had a purulent ozæna and larynx-stenosis, which disappeared under the use of sublimate baths. From then on the child was healthy. The father was examined immediately after the birth of the child, and it was found that he had himself become infected, and had infected his wife about the fourth month of pregnancy.

2. In the second case also, the symptoms and a clear history showed that the husband had become syphilitic, and one month later, in the *sixth month* of pregnancy, had infected his wife. Active treatment by inunction. Birth at full term of healthy child. Child passed out of Dr. B.'s observation, but at three months had what was called chicken-pox—failed, grew thin, and died. At the autopsy, Dr. B. found unmistakable signs of syphilis. The parents, after the child's birth, had had no manifestations from which the child (which was artificially nourished) could have acquired a syphilis. Dr. B. considers that three months is not a sufficiently long period of observation to enable us to declare a child free from syphilis. He has seen it make its first appearance after eight months.

As a sort of offset to these two cases, Dr. B. reports a series of cases of syphilis in one family during many years. The husband of an undoubtedly healthy woman acquired syphilis half a year after his marriage, and his case was long-continued and obstinate. In fifteen years, twelve children were born—the first seven dead, in the seventh and eighth months; then one living, which died in two months of syphilis; two years later the ninth, living, syphilitic, but cured; two years later a healthy child, the tenth; two years later, the eleventh, with severe syphilis, but which lived, and, again, after two years, the twelfth, which gave no decided syphilitic signs. *The mother remained perfectly healthy.* Here, therefore, no placental infection took place, and Dr. B. is of the opinion that "while placental infection certainly is possible, it just as surely *may not* take place." A woman infected during her pregnancy may have a

healthy child, and another, in spite of being pregnant with a syphilitic foetus, may remain healthy.

The inheritance of syphilis is not bound by such firm laws as Kassowitz has sought to set up. There come into the reckoning some wholly unknown factors, which we must class under the name of individual disposition, since we are not able to say anything more decided about them. The law that a child can be infected only by a syphilis acquired by the mother in the *first* half of pregnancy is as untenable as the assertion that this can only occur in the later months. Seissel goes with Hutchinson so far as to claim a syphilis, not only of women who have become pregnant from syphilitic men, but even of those who have had continued intercourse with such men and remained barren. This they say is a sort of gradual, protracted impregnation of the tissues with syphilis, and occurs only in women. Dr. B cannot accept this theory. For then these women, not occasionally, but, as a rule, would be suffering from an altogether exceptional form of syphilis without there being any peculiar quality to be ascribed to the syphilis virus in the man's semen. The axiom, "*Pas de syphilis de l'enfant sans syphilis de la mère*" Dr. B. denies in toto. He does not trust to the generally accepted experience that syphilitic children have not infected their mothers as they might have been expected to do—an experience which is of course brought forward as proof of the statement that the mothers of such children are always syphilitic, even though the disease is latent. The published cases do not show accurately either that the mothers did not before have manifest syphilis or that the children offered any easy opportunity for infection (syphilitic sores in the mouth, with eroded nipples of the mother). The law of Colles is not proven, nor was it declared by him, for he only declared the immunity of mothers who were syphilitic beforehand, but by Diday, who, in Behrend's opinion, arbitrarily made the law general. Guibaut and Ranke have published contradicting cases.

Dr. B. believes that we should only allow the mother of a syphilitic child to nurse it so long as both remain in strict medical control and the mouth and lips of the child are absolutely healthy; and that we must absolutely prohibit it when the mother has acquired syphilis during the pregnancy, but the child at the time of birth appears free from it, and this holds even if the mother is apparently cured when the child is born.

15. Englisch: Congenital Contraction and Obliteration of the Male Urethra (*Archiv f. Kindhlkde.*, II. B., 3 H.).—DR. J. ENGLISH distinguishes between defects, obliteration or atresia, contractions caused by drawing together of the canal and contractions of valvular form.

In cases of obliteration, we find instead of the urethra a soft cord, consisting of tunica propria, corp. spongiosum, submucous cellular tissue and membrane, the canal lost through the adhesion of the membranous walls and the growing together of the epithelium (conglutatio). After increase of vessels, the membrane may melt away, and we then have a cord formed only of cellular tissue and corp. spongiosum, and this latter may also disappear in the growth of the cellular tissue, and the cord, composed of this latter alone, become smaller and smaller.

Such obliterations are called atresia membranacea when they extend over a very short distance, and they are found at the meatus, fossa navi.

cularis, pars cavern., pars membran., or even at the orifica vesicale urethræ. Judging from forty-five cases, E. found that the *short* obliterations occurred most frequently at the fossa navicularis and pars membranacea, but that the longer obliterations, from meatus over pars cavernosa, were more frequent. The penis is usually normal or small, sometimes continually erect, sometimes without the raphe of the prepuce. The foreskin is normal, very long, or short and adherent to the glans. Very often there are accompanying defects of the rectum. All these changes take place early in foetal life. Besides the results of the stoppage of the urine, the urachus often remains open, not in consequence of the backing up of urine, for it takes place before the kidneys secrete urine, but as an accompanying fault of development. We also often find openings of the urethra back of the point of obliteration, safety valves which make possible the saving of the foetus. It has occurred that children with complete atresia have been carried to full term and not died till two or three days after birth from uræmia.

16. Brault: Changes in the Kidneys in Albuminuria Diphtheritica (*Journ. de l'Anat. et de la Phys.*).—DR. A. BRAULT gives the result of the examination of five kidneys from children who had died of diphtheria, and in whom the kidneys were known to be normal beforehand, but albuminuria developed during the diphtheria. Macroscopically congestion could be observed in two cases, in the others nothing. With even a low magnifying power, it could be seen in all the cases that the capillaries of both cortical and medullary substances were enlarged and filled with blood, the convoluted tubules were here and there distended by a firm exudation, or, if of normal size, the canal was almost filled by a grayish-black coagulum. With a higher power, the vessels of the glomeruli could also be seen to be distended; here and there were hemorrhages in them, and in the interior of the glomeruli were white blood-corpuscles and loose epithelial cells suspended in an exudation which formed a network and contained, also, partly gray and partly clear round and oval bodies. The walls of the glomerulus were normal, and the epithelium increased and prominent. The epithelium in the convoluted tubules was also so greatly increased as to, in many cases, close the canals. In other places, the distinctness of the epithelium was lost in a mass of protoplasm containing fine nuclei, or the epithelium contained spaces filled with a colloid mass containing whole or fragmentary blood corpuscles. The cells were everywhere infiltrated with a granular proteine mass to a high degree. Dr. B. could not show that these masses consisted of micrococci. The exudation contained in the convoluted tubules was identical with that in the glomeruli, except that the former contained more of the round colloid bodies. In the straight tubes, the inflammatory changes were not so marked. The connective tissue between the tubules was normal. This nephritis diphtheritica may be called parenchymatous or epithelial, in contradistinction to diffuse nephritis. When the causes which have brought about these changes pass over, normal relations are again found. A continuance of them may lead to closure of the tubules, anuria, uremic symptoms, eclampsia, and dropsy. In the majority of cases, however, the albuminuria seems to make but little change in the course of diphtheria.

18. Crede: Prevention of Ophthalmia in the New-Born (*Arch.*

f. Gyn., 17 B., 1 H.). — PROF. CRÉDÉ considers it demonstrated that conjunctival blennorrhœa of the new-born is caused by contact with the vaginal secretion during parturition, and he has hunted for methods of destroying the plague, and since cleansing and treating the vaginae of the women has not sufficed, he has tried the direct disinfection of the eyes. Immediately after birth, after washing out the eyes with a 20% solution of salicylic acid, he drops into them a solution of argent. nitrat. (1 : 40). He claims that this was always effective, but it was afterward slightly modified. The eyes were washed out with water, the silver nitrate solution (1 : 50) was dropped in from a glass rod, and then compresses wet in a 2% salicylic solution applied for twenty-four hours. Since this treatment was commenced, the conjunctival inflammations in the institution have ceased, though the vaginal douchings have been given up entirely. The irritation, hyperemia, and increased secretion caused by the treatment only last twenty-four hours. At the clinic (Leipzig), from 1874 to May 31st, 1880, there were 226 cases of blennorrhœa out of 2,266 births, that is, about 10%. From June 1st, 1880, when the treatment was begun, to July, 1881, out of 200 cases, there was only one blennorrhœa, and in that case the prophylactic disinfection had been omitted.

Dr. R. Olshausen (*Centrbl. f. Gyn.*, 2, 1881), at the clinic at Halle, uses as prophylactic in these cases a 1% solution of carbolic acid. The eyes are simply washed out with this. With this treatment, the percentage of cases fell in two years from 12.5% to 6%. Some months ago, the treatment was improved by washing the lids as soon as the head was born, not waiting for the trunk, and washing the eyes again afterward. By this means the percentage was brought down to 3.6%, and the cases of inflammation were mild and slight. More lately still, Olshausen uses a 2% carbolic solution.

18. Kormann: H. O. Opel's Nährzwieback (*Jahrbch. f. Kindhlkde.*, XVII. B., 1 H.).—When so high an authority as PROF. ERNST KORMANN recommends an article of nourishment, it is worth noticing. Opel's Nährzwieback is a kind of biscuit prepared in Leipzig, and recommended especially for rachitic and poorly nourished children. Kormann has experimented most carefully with it, and gives long tables of weights and measurements to show his accuracy. He draws the following conclusions.

1. Opel's Nährzwieback is certainly a useful addition to the food of children after the sixth month, and often after the fourth month.

2. In its composition and preparation, it, as a biscuit, certainly surpasses others of the kind, especially in its phosphatic contents.

3. It increases the absolute and relative growth of the body, and supplies the necessary salts for the osseous system of the child.

4. It improves rachitis or predisposition thereto, and perhaps a longer period of observation will show that it cures it.

5. Opel's Nährzwieback is not too dear—is cheaper than most of the other preparations, kindermehle, etc.

19. Laskewitsch: Various Methods of Treating Diphtheria (abstr. in *Jahrbch.*, B. XVII., 2 u. 3 H.).—PROF. LASKEWITSCH, to convince himself of the efficacy of pilocarpine, used it in some severe cases, considering the milder cases as apt to do well under any good treatment. He reports nine cases occurring in well-nourished children, between two and seven years, and taken into the hospital on the first to third day of the

sickness. The only medicines given them were pilocarpine, in Guttman's doses, and coca wine. In spite of these, in all the cases the diphtheritic process continued to extend, in three cases to the larynx, in two to the nose, and in one to both. In only one case did there seem to be an improvement of the local symptoms. In six cases there was slight albuminuria. There was only one of the cases in which the temperature did not go above 38.5° C., and in the other, it reached 39° C. and over. All the cases ended fatally, seven of them on the fourth to sixth day, and two on the seventh to tenth day. Death was caused in four cases by larynx stenosis and in five by paralysis of the heart.

DR. BOSSE (Berlin) thanks a lucky chance for discovering to him a most excellent remedy for diphtheria. Through an accidental interchange of bottles, a diphtheritic patient got a teaspoonful of turpentine and recovered. After that, B. treated twenty-three children, between two and twelve years old, with severe forms of diphtheria, by giving them one dose of 8.0-12.0 grm. ol. terebinth. rectif., and then as much milk as they would drink. In some cases, a second like dose had to be given in twenty-four hours, but all twenty-three recovered after forty-eight hours. The turpentine, he says, accomplishes equally good service in severe (toxic) forms of scarlatina. A later number of the same magazine (*Berl. klin. Wochenschrift.*) has another article by Bosse, in which he reports more very brilliant results from this same treatment. He treated his wife by giving her a tablespoonful (13.0 grm.) two mornings in succession, followed by a cup of milk. He also treated twenty other cases, some in very small children. Two died, but these he designates as "absolutely desperate." Vomiting occurred eleven times, sometimes a slight diarrhoea, once strangury. There was never any inflammation of stomach or bowels caused by the oil.

DR. AUNUSCHAT (Liegnitz) reports good results from the internal use of Hydrarg. cyanat. (0.1-0.2-0.4 to 100.0 and hourly a teaspoonful). As a rule, the local process ceased to advance after twenty-four hours, the membrane loosened, and the general condition improved. To be sure, the doctor weakens his statement by adding that the more advanced the case the less worth has the remedy, and it is absolutely worthless when the larynx is involved.

DR. C. G. ROTHE had for eleven years used iodophenol locally in the treatment of diphtheria. In the twelfth year, some badly ending cases taught him that the remedy was not reliable. He sought for a remedy which, while acting *locally*, should, in a certain way, *from within outward*, control the process. This he believes he has found in hydrarg. cyanat. He gives a teaspoonful hourly of a solution 0.02 to water 60.0, and tinct. aconit. 1.0. He considers the remedy as "not an absolute specific."

DR. GOUTERMANN (Halver) uses simply painting of the throat every half-hour with lime-water, giving two to three hours rest at night. He always observed a separation of the exudation about the fourth or fifth day without any consecutive disturbances. In a second epidemic, he substituted lime-milk for lime-water. When the children opposed the painting, the lime-milk was injected in the throat with a syringe. Results very brilliant.

DR. GEO. GUTTMANN believes that he has found a perfectly sure,

almost specific, and perhaps "epoch making" remedy for diphtheria. He has treated sixty-six cases—fifteen of the very severest form, thirty-three severe, and eighteen mild. From his earlier experiences, he expected thirteen to seventeen deaths. With this new method all recovered in one to three days, except that of the fifteen very severe cases—two took nine and eleven days, and the other thirteen took two to five days. The method consists in the internal use of pilocarpine, by which, *with the increase of the flow of saliva, the diphtheritic membrane and infiltration is loosened and the rapid resolution of all inflammatory symptoms brought about.* Pilocarpine is also an excellent remedy in larynx croup. Of four cases of this, two died, but they were very far advanced before the drug was given. The formulæ are as follows:—For adults—pilocarpin. mur., 0.03-0.05; pepsini, 2.0; acid. mur., gtt. 100; aq. dest., 240.0. Teaspoonful (fl. $\frac{3}{4}$ ss.) every hour. For children—pilocarpin mur., 0.02-0.04; pepsin, 0.06-0.08; acid. mur., gtt. 11; aq. dest., 80.0. Teaspoonful every hour. After each dose to children, a teaspoonful, and to adults a tablespoonful of strong wine. This medication must be continued throughout the night, and every eight hours warm applications made about the neck, and every two hours milk—no coffee or soup—ice and ice-water frequently.

DR. GÉZA FALUDI found good results from pilocarpine in ordinary cases, but in severe cases complicated with larynx croup it failed him, and in pure croupous laryngitis it proved absolutely worthless. He used it strictly according to Guttman's method.

DR. R. WEISSE (Berlin) surely has a right to express his opinion on the treatment of diphtheria. He treats yearly at least one hundred and fifty cases, and since Easter of 1879—more than one and one-half years—he has not lost a case. His method of treatment is not even a new one, but a combination of well-known remedies. He reports in detail only fifty-four cases, all ending favorably. His principal remedy is a solution of 1.0 acid. salicyl. in $\bar{a}\bar{a}$ 25.0 glycerine and spir. vini rect., the glycerine being added to prevent too rapid evaporation and too much irritation. Beside this, salicylic acid 1.0 to 300.0 water is given as a gargle, and, internally, natr. benzoic. (sodii benzoat.) 5 : 200, hearty nourishment, and strong wine.

His order of proceeding is:—first half-hour, painting or inhalation with the strong salicylic solution; second half-hour, wine; third half-hour, natron. benzoic; fourth half-hour, wine; fifth half-hour, gargling with salicylic solution in water, and so on around again day and night, only hourly at night instead of half-hourly. Dr. Weisse states that his method is *not* absolutely sure. For the inhalation he used a hand-bulb spray apparatus, with the two tubes running out together.

Here are grouped a *few* of the modern methods of treating what this fall seems to be around New York a malignant enemy. We can all take our choice.

20. Unruh: A Contribution to the Pathology of Diphtheria (*Jahrbuch f. Kinderheilkunde.*, XVII. B., 2 u. 3 H.).—DR. OSCAR UNRUH (Dresden) attempts to show by his article some signs to guide us in the treatment of diphtheria. He first speaks of the multitudinous remedies offered and the empirical way in which they are used, and says that no one should recommend a remedy till he can clearly show, not only that

a certain percentage of cases have not died under its use, but also that it more rapidly and more frequently than other remedies cuts short the local process and prevents general infection. No one has been able to do this positively, because we have no definite rule to determine whether in any given case we have to do with a local or a general infection. Until this question is settled, the reported results of various methods of treatment are not of much value. It is with the idea of aiding in the settlement of this question that the author has tabulated a series of cases which came into his hands during a year. There were eighty-one cases in all. In regard to general pathological data, the author's statistics agree with those of others. In regard to the particular point brought out later in the article, only fifty-three of the most carefully-observed cases are tabulated. The author starts with the assertion that "Diphtheria is a contagious infectious disease which, in a certain number of cases, runs its course as a local affection, while in others the local affection leads to constitutional infection."

Without stopping to argue this point of whether or not the primary affection is the local one, the author, starting from this premise, next remarks that we have no sure sign for determining *when the affection has ceased to be local and become general*. In cases of very severe constitutional infection, the diagnosis may be easy; but these, fortunately, are the rare cases. It is much to be desired that we could determine it in all cases. The temperature will not greatly help us. It has no classic diphtheritic curve, and we may not only have high fever without general infection, but also general infection with very little fever. He cannot depend on the statements and complaints of the patients, especially as most of them are children. The amount of glandular swelling is also a sign of very little value. There seems to be no generally recognized sign of the constitutional infection.

Here now is the author's point. He believes he has found albuminuria to be such a sign. In searching through the literature of the subject he wonders that he has not found such a statement as this. "Albuminuria is the first and the only absolutely sure sign that general infection has taken place. It never is absent in cases where from other symptoms we discern constitutional infection, and *we may deny the presence of constitutional infection if albuminuria is absent.*"

He has come to this conclusion through careful daily examination of the urine in all his cases, and especially through exact observations of the relation of the occurrence of albuminuria to the *duration* of the local process.

Examination of the urine is not as faithfully carried out as it should be in cases of diphtheria, and statistics as to the frequency of albuminuria vary greatly. The author found it in thirty per cent of his cases. He does not, however, make any point of that, further than to remark that its occurrence is more frequent than generally supposed.

The question which has been neglected by other observers is, "when does the albuminuria begin, how long can a local affection exist without causing it, and does in fact the duration of the local affection have any influence on the occurrence of it?" If it is shown in a large number of cases that albuminuria *only occurs* and also *never is absent* when the defining of the local affection has extended beyond a certain time, then the

author claims it will be proved that "the occurrence of albuminuria is identical with constitutional infection." The author is not so bold as to lay down any rule as to critical days, but his cases seem to him to prove that the circumscription and duration of the local process stand in a certain causative relation. The intact mucus membrane offers a certain resistance to the onset of the infection. This varies, of course, in individuals, but only within certain limits, depending somewhat on the treatment used.

In all the cases tabulated, the same method of treatment was used. We find that, exclusive of the cases in which rapid death occurred from septicemia, albuminuria occurred only in those cases in which the local affection continued to extend for more than six days, with the exception of a single case in which, though the local trouble was defined on the fifth day, the albuminuria appeared. On the other hand, with again one exception, in no case was albuminuria absent when the local affection continued to extend for more than seven days.

Though the number of cases was small, the facts were so striking that the author feels justified in saying that "albuminuria is not a sequel of diphtheria, but a not very rare complication, and, in his belief a constant accompaniment and perhaps the only sure symptom in the chain which shows constitutional infection." Temperature may help somewhat, for in most of these cases there was a rise before the commencement of constitutional infection. The degree of albuminuria varied greatly and seemed to depend on the intensity and extent of the local process.

The author purposely uses the term *albuminuria* and not *nephritis*. He usually found casts in the urine, but not blood. He believes that the constitutional affection causes a disturbance of transudation and hence the albumen.

In closing, he explains the rapidly fatal, septic cases by saying that either the contagion attacks a membrane already unsound or it is in itself so intense that even a healthy membrane can offer no resistance to it. We may see the same thing in all acute, infectious diseases, scarlatina, typhoid, etc. The absence of albuminuria in these cases is explained by the rapidity of their fatal course.

THE AMERICAN
JOURNAL OF OBSTETRICS
AND
DISEASES OF WOMEN AND CHILDREN.

VOL. XV.] APRIL, 1882. [No. 2.

ORIGINAL COMMUNICATIONS.

THE TREATMENT OF CANCER OF THE UTERUS.

BY

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(With four woodcuts.)

I WOULD offer no excuse for the preparation of this paper. The great importance of the subject, the want of familiarity in the profession at large with its early diagnosis and treatment, and, more than all, the terrible suffering, both mental and physical, which it has been my lot to witness, have combined to interest me in this dreadful malady, and awaken a strong desire to help its most grievously afflicted victims.

It was my fortune to be House Surgeon at the Woman's Hospital in New York when Dr. J. Marion Sims and Dr. T. G. Thomas were doing so much for cases of this class. I say "doing so much," because the combined work of two such surgeons, could it have been encouraged or even allowed to go on, must inevitably have resulted greatly towards perfecting means for cure. Most unfortunately, the Governing Boards of the Hospital saw fit to exclude from it entirely all cases of cancer of the uterus.

Dr. Thomas was then (1872 and 1873) working with the galvano-caustic wire, drawing down the cervix, and removing a

funnel-shaped piece of its supra-vaginal portion. Dr. Sims was doing the same thing with the uterotome, scissors, and cutting curette, with the subsequent application of styptic cotton. Both were obtaining fair results. From the AMERICAN JOURNAL OF OBSTETRICS for July, 1879, we learn that Dr. Sims saw the necessity of destroying more tissue than he was able to do at the primary operation, and that to this end he applied chloride of zinc on cotton to the funnel-shaped cavity upon removing the styptic iron cotton.

After settling in Boston, it was three years before I saw a case of cancer of the uterus, although from my connection with the Boston Dispensary and the Free Hospital for Women (which through the kindness of the public I was enabled to establish in 1875), and in my private practice, I had abundant opportunity to observe uterine cases of all sorts. At the end of that time, however, three cases came in one week; and since then, there has certainly been no lack of material from which to study this special disease.

The first case upon which I operated was referred to me by Dr. W. C. Holyoke, and was an admirable one for operation. The disease was wholly confined to the infra-vaginal portion of the cervix, and was most readily removed with the scissors. As a safeguard against its return, I removed, as well, a portion of the supra-vaginal cervix. So sure was I of the entire removal of the disease, that I closed the wound with silver sutures as in an ordinary amputation of the cervix. The disease returned by the side of the cicatrix within two months, and the patient died within a year. It was then that I determined upon the operation which I have since followed, and which I believe to be superior to any which I have seen described; not differing so much from *parts* of other operations, but uniting the advantages of several, and discarding their objectionable and even their less important features. I should divide all operative cases into two classes: 1st. Those where the disease is limited to parts which can be entirely removed. In these cases, I should hope to cure, or at any rate give a long respite from the disease. 2d. Where the disease has so infiltrated the parts about the uterus that it is impossible to remove more than its superficial and most vascular portions, as a relief from frequently recurring hemorrhages or from sloughing tissue, not only highly offensive to the patient, but deleterious from its septic influence.

The operation must, therefore, differ materially under the conditions just described. Yet it is not an easy matter always to determine the extent of the disease; for the vagina may be so filled with its mass that until some of it is removed it is impossible to know whether the vagina upon either side, in front, or behind be implicated. Again, unless we can obtain the most perfect coaptation of the hand and finger in conjoined manipulation, or can seize the cervix with the volsellum, and thus test the degree of fixation of the uterus, we may be unable to decide whether there be an extension of the disease into the cellular tissue of the broad ligaments or to any of the lymphatic glands, so abundant about the uterus. Or, again, how can we be sure, except as the operation progresses, how far up the canal of the cervix the disease has extended, or whether it has not already encroached upon the body of the organ? I can truly say that I know of no operation that the gynecologist is called upon to perform which requires so much boldness, skill, readiness, patience, and good judgment as this; and, in its performance, each or all of the qualities mentioned may be taxed to the utmost.

If the case be suitable for operation and belong to the first class described, and if, fortunately, the disease be limited to the cervix uteri, as in the diagram, Fig. 1, the patient being etherized and placed in the Sims position, the cervix is seized with the volsellum forceps and dragged down as nearly to the outlet as possible. This not only facilitates manipulation, but diminishes, in fact almost entirely checks, the hemorrhage which otherwise may be alarming. The portio vaginalis is then cut into anteriorly with the scissors, and the supravaginal cervix anteriorly is separated from the bladder with the scissors, aided by the forefinger in tearing the tissues. This part of the operation is similar to Schröder's for the removal of the uterus by the vagina.

The same incision is then made into the vagina posteriorly, and the supravaginal cervix separated from the peritoneum up to the level of the internal os uteri. Thus it will be seen that the peritoneum is not purposely opened in an uncomplicated case, as is done by Schröder's method. But the peritoneum is closely attached to the uterus at the level of the internal os, and it may accidentally be cut into, which has been my experience in two instances. The anterior and posterior incisions being now

connected by lateral ones, and the supravaginal cervix separated on the sides in the same manner as was done in front and behind, the uterotome is to be substituted for the scissors, and a funnel-shaped portion of the body of the uterus cut out, as represented in the diagram, Fig. 1, B B to C. This step of the operation is like Sims', with the exception that here it is possible to remove more of the body of the uterus, because here the angle B C starts from the level of the internal os uteri at the junction of the peritoneum to the body of the uterus, both before and behind, and the apex of the cone removed extends nearly or quite to the fundus of the uterus: whereas, following Sims' method, the base of the cone is at A A, and a portion of the supravaginal cervix and more of the body of the uterus must be left.

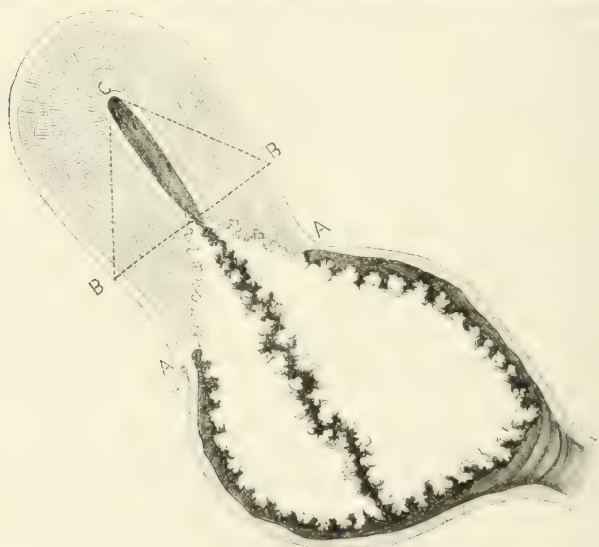


FIG. 1.

It is thus possible to remove the entire cervix, both infra- and supra-vaginal, and at the same time nearly or quite one-half of the body of the uterus, and that the most important half; for cancer of the body of the uterus, whether of primary origin or of extension from the cervix, affects the glandular structure first, and by the method I have described, this, its natural habitat, is removed or destroyed. It is in the connective tissues which so predominate in the cervix that the disease there develops so readily, and this, it has been seen, is entirely removed. The actual cauterization, at a red heat, is then applied to the whole denuded surface. This part of the operation takes considerable time;

for, as the traction is relaxed, there is likely to be more or less hemorrhage, and it often requires much patience to apply the cautery thoroughly enough to each and every bleeding point to feel secure in putting the patient to bed without tampon or other dressing to control hemorrhage. It is possible to accomplish this, however, and it is a very great gain in the subsequent treatment of the patient. The operation can seldom be done in less than half an hour, and will frequently require from three-quarters of an hour to an hour.

So long as the disease has not touched the rectum, we may still hope to remove it entirely, as I have done in three instances, even though it has implicated the whole thickness of the vaginal membrane and submucous tissue quite to the peritoneum posteriorly over a large surface. The operation must differ from that just described, in that the incision into the vagina posteriorly must be made a full quarter of an inch beyond the line of any infiltration, and extend quite through into the peritoneal cavity, removing the whole of the upper vagina with the supravaginal cervix. Before applying the cautery, the edge of the healthy vagina should be stitched with silver sutures to the lower part of the posterior wall of the uterus. So, too, if the anterior vaginal membrane be implicated in the disease, it may be dissected off the bladder. If the base of the bladder itself even be affected, so long as the ureters are not involved, we may cut away a large part of it, if we can thereby remove the entire disease, closing the fistula thus formed with silver wire before using the cautery.

The after-treatment consists in perfect quiet in bed and the use of the catheter if the patient be unable to use the bed-pan without straining. If the catheter be necessary, it should be used each six hours, as much vesical distention may stretch the cauterized surface sufficiently to induce secondary hemorrhage; or, later on, as the slough from the cauterization separates, the bladder, lacking the support afforded it by the vaginal membrane or the supravaginal cervix, may suffer rupture at this part.

A nourishing liquid diet is desirable for a few days, or until all danger of pelvic peritonitis has passed—a complication which very rarely occurs. It is seldom necessary to give opium, except for its constipating effect. This it is desirable to secure for a week or ten days even, as there is danger of rupture through

into the peritoneal cavity and of secondary hemorrhage, from the dilatation caused by the passage of feces down into the rectum, and from straining in the effort to expel them from it.

If the rectum becomes distended with gas, as is oftentimes the case, the rectal nozzle of the ordinary syringe, or even the long rectal nozzle carefully placed, should be used. There is seldom much or any pain complained of after the operation, the application of the cautery apparently destroying the sensibility of the parts. Of course, if pelvic peritonitis arise, it must be treated by the free administration of opium, as in other instances. The temperature and pulse seldom rise above a hundred, and more often the temperature remains at 99°. The patient should remain in the recumbent position in bed for two weeks, as it is unwise to bring any abdominal pressure on the parts until cicatrization is pretty well established. After convalescence, the patient must be thoroughly examined with the speculum each month for the first six months, and then each two or three months for several years. If any little outgrowths appear, they should be removed, as advised by Dr. Sims in his admirable paper already referred to, with the sharp curette. Instead of the subsequent application of chloride of zinc suggested by him, I should use the thermo-cautery as in the primary operation. I do not consider the internal exhibition of arsenic or other alteratives of much importance, and have seen no greater progress in cases thus treated, not even when watched most closely, as has been done in the ward at the Free Hospital for Women exclusively devoted to cancer of the uterus.

In the second class of cases, where operative interference is resorted to for relief from hemorrhage, or to remove a mass of sloughing tissue, the disease having involved those parts which fix the uterus, the curette should be used as recommended by Dr. Sims, but is best followed by the thorough use of the thermo-cautery.

In looking through my record books, I find the histories of forty-seven cases of uterine cancer treated in the past four years. This includes the cases treated in my private and public hospitals, but not those treated at the Boston Dispensary, of which I have retained no record. Of these forty-seven cases, twelve were operated upon, and the hope entertained that the entire disease had been removed. In two of the twelve, the diseased cervixes were removed with scissors and uterotome, and the

wound closed with silver sutures. In one case, the disease returned after two months, the patient dying in seven months: in the other, it returned almost immediately, and the patient died in fifteen months. One other of these twelve I am permitted to include here, by the kindness of Dr. M. A. Morris, of Charlestown, whose immediate patient she was. I saw the case in consultation with him and was present to suggest the steps of the operation, which were most skilfully carried out, and consisted of the amputation of the intravaginal portion of the cervix, the removal of a conical portion of the supravaginal cervix, and the thorough application afterwards of the thermo-cautery.

This patient is still living and enjoying good health after a period of four years, although I understand from Dr. Morris that within two or three months there have been some signs of recurrence. In the remaining nine cases, the operation, as previously fully described and figured, was done: and the result has been a return of the disease in one case after nine months, the patient refusing to have anything further done; in another, the disease showed itself in the lumbar and iliac glands, and the pancreas, and finally returned in the uterus. The patient died in three months from the time of the operation. The remaining seven are living and well, after periods of twenty-nine, twenty-seven, twenty-two, twenty-one, eighteen, eighteen, and eleven months respectively. There are then nine living out of the twelve where it was hoped the disease had been removed. Of the three patients who died, one was unwilling to follow up the treatment which certainly promised as much for her as for any of those who survive. In the other two cases, the operation was only very partially done and no application of the thermo-cautery made.

Of the thirty-five cases remaining of the original forty-seven, ten were operated upon simply to ameliorate the symptoms from which they suffered. With these also I have taken the liberty to include a patient of Dr. H. E. Marion, of Brighton, upon whom he operated. Although not present at the operation, I saw the case several times in consultation with him, and had charge of it for a short time during his absence; and also one which Dr. W. E. Boardman assumed charge of, as I was just leaving the city at the time of the operation, at which I had the pleasure of assisting him. There was no hope entertained in any of these cases that a long respite could be secured,

as the disease could not be wholly removed. Yet, in one of them, by repeating the operation three times at intervals of some months, the patient lived three years and five months, and was kept free from many of the sufferings which make life so intolerable with this malady.

Of the remaining nine, six lived, eighteen, ten, nine, eight, seven, and seven months, respectively. Two are still living, after periods of twelve and eight months, and the other one was discharged from the Free Hospital for Women four months after the operation, and I have since been unable to learn her condition.

Of these ten cases, six were operated on once; two, twice; one, three times; and one, four times. Five of the ten were cases of cancer of the body of the uterus, being the only ones in the whole forty-seven where it was not almost certain that the disease began in the cervix uteri; in these five cases, however, the cervix was not affected, except in one instance, and that late in the progress of the disease. In three of the five, when first seen, the body alone was affected; there being no evidence whatever of disease in other parts. It is to be regretted that in these three cases gastrotomy was not performed, with removal of the body of the uterus, making a pedicle of the neck, after Péan's method for removal of the uterus for fibroids. It might have given the patients a better chance. In these cases of cancer of the body of the uterus, the operation done was removal of as much of the disease as was possible by the curette alone, or by the curette followed by a thorough application of pure nitric acid to the whole interior.

We have thus accounted for twenty-two of the forty-seven cases, twelve having been operated on with the hope of cure, and ten for the relief of some distressing symptom. Of the remaining twenty-five, many refused any surgical interference, although, on account of the foul discharge from sloughing tissue or of hemorrhages, there was every reason to think their condition could be made more comfortable. In some cases, there was no discharge of any kind, pain being the prominent symptom. As this could, in a measure, be controlled by opium, the necessity of an operation was not urged. Some were so advanced in years, being over seventy, that any operation was thought inadvisable. In no single instance in the whole number of cases, where there was any hope of removing the entire dis-

ease, was the operation refused; and, although the surgical procedure was oftentimes severe, death in no instance followed as its result: and only twice was pelvic peritonitis present as a complication. Many of those who refused operation were willing to try the internal exhibition of medicines, and both Chian turpentine and arsenic were faithfully tried; but I failed to see the slightest beneficial effect from either.

From the foregoing summary of cases, we have found that in less than twenty-five per cent only was there any possibility of removing the entire disease when the patients first came under observation. As the disease in forty-two of them began with the cervix uteri, a specular examination, had it been made earlier, must certainly have revealed its presence. From a careful study of the histories of these cases, the following causes present themselves as prominent for delay in this matter:

1. The reluctance of the patient to consult her physician for fear that an examination may be necessary; and her great shrinking, through delicacy or through fear of being hurt, from this means of determining her condition.

These fears the physician can overcome in a great measure; for, if his manner be not only kind and tender, but dignified; if his patients see that he respects and is careful to guard their keenest sense of delicacy, and, more than all, to protect them from all exposure, he will enable the most sensitive patient to consult him freely.

Nor can he be too careful to spare her physical pain during his examinations. He should remember, as he introduces the Sims speculum, that the parts he is touching are naturally highly sensitive, and that, under the influence of disease, they become much more so. Let him then proceed slowly and gently, being most careful to avoid the cervix with the point of the speculum, if, in the digital examination, the cervix was the part found to be affected. This may readily be done with the patient on the side, and the point of the Sims speculum retracting to its full extent the posterior vaginal wall. An examination can usually be thus completed without pain to the patient, and without causing any flow of blood by touching the diseased mass, even though, as is often the case, it may largely fill the vagina.

2. From the absence of any marked symptom, the patient

may be wholly unaware that any trouble exists until the disease is far advanced. This is well illustrated by the following case:

In September, 1876, I was consulted by Mrs. J. F., aged forty-four years, who was married to her first husband when twenty-one, and to her second when forty-one. She had had six children and two abortions. She was a strong, healthy-looking woman, without the slightest appearance of cachexia. Her menstruation, which first appeared when she was thirteen years old, had been regular and normal, with the exception that when due eight weeks before, it did not appear; but, when nearly time for its appearance again, she had been suddenly taken with flowing, the blood being quite bright and free. This had continued for

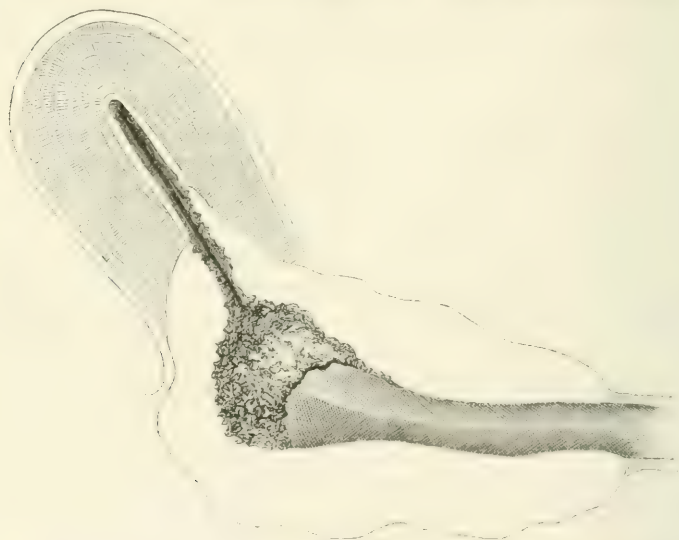


FIG. 2.

three or four days at a time for a month, or until she saw me. She had had no pain of any kind before the hemorrhage, nor did it make its appearance until two weeks before coming under my notice. During these two weeks, however, she had suffered more or less pain of a grinding character through the hips and lower abdomen. After the hemorrhage, there had also been a thin, watery discharge, which had become offensive within a few days only. Examination revealed the cervix entirely ulcerated away, leaving a large excavation into the uterus. The anterior vaginal wall was largely destroyed, but no perforation of the bladder had occurred. The posterior vaginal wall was thoroughly infiltrated with the disease. No treatment was advised save the local application of nitric acid and vaginal injections of carbolyzed water.

The patient died within three months from the time when first seen by me. The extent of the disease can be better judged of by the accompanying diagram (Fig. 2).

In this case, there was nothing to excite the slightest apprehension on the part of the patient until the appearance of the hemorrhage; and yet the disease must have been progressing for some months. It is not probable that such an amount of destruction as was found could have occurred in four weeks. It may be that symptoms are sometimes present and that the patient, accustomed, as she may have become, to suffering pain during the years of her menstrual life, to excessive or irregular menstruation, or to leucorrheal discharges which, being retained, have become foul, attaches no importance to them and is excited to no alarm. She therefore delays seeking the aid she so much needs.

3. Much valuable time is often lost by the reluctance of the physician to make a careful examination with the speculum. I have been repeatedly told by physicians that, although the patient had complained of more or less pain in the uterine region, or of irregular hemorrhages, yet they had thought them of little importance, had prescribed a tonic or astringent vaginal injection, thinking the symptoms due probably to the climacteric period; or that they disliked to have anything to do with uterine cases, and hence had made no physical examination of the case until specially requested so to do by the patient or by some member of her family; or yet again that they had not the conveniences or necessary instruments for doing it properly, and had therefore tried in every other way to improve the patient's condition in the hope of avoiding the necessity for such procedure. All these reasons seem to us most worthless and unsound. We can understand why, in the case of a young maiden, we should defer, for a time at least, a physical examination until other means of recovery have been tried. But fortunately this is not usually a disease of girlhood; and, even if it were, is there any reason why we should not administer ether and do our whole duty by the patient who intrusts her health, or it may be her life, to our care? If the physician feels himself incompetent to make the necessary examination, or has not the requisite instruments, let him early call to his aid some one who has the essential knowledge, skill, or implements. The practitioner is greatly to be blamed who postpones the necessary means of

diagnosis from inattention to early symptoms or from a shrinking from the measures indispensable to the determination of their significance.

4. Want of familiarity, among many of the profession, with the early appearance of the disease. A mistake in diagnosis is very unlikely when there is much loss of tissue and the surrounding parts have become deeply infiltrated; but this is too late to render much service to the patient. An early diagnosis is very necessary, and this is not always an easy matter unaided by the microscope. I have seen more than one case in which the appearance was that of a small, well defined, benign ulcer; and were it not for a sharply cut edge or overlying proliferation of granulations to arouse a suspicion of something mischievous, it would readily have passed for and been treated as a benign ulcer of the cervix. It is perhaps superfluous to say that every possible means should be called to our aid to establish our diagnosis, and that in the early stages of the disease nothing can help us so much as the microscope. Without it, the over-anxious would do many needless or too severe operations; and the less zealous would neglect all measures, or rely upon too mild ones, for the proper treatment of the case.

5. Sometimes the physician delays operative interference, even though the diagnosis has been made early, from a disbelief in the power of any remedial agencies in this disease. To such I would say that there is surely nothing to be gained by non-interference; and when such results can be shown as have been reported by Drs. T. A. Reamy and J. Marion Sims of this country, or by Freund and Schröder in Europe, it would seem as though it were a question that would decide itself in the mind of every honest practitioner.

If the objection be raised that possible mistakes in diagnosis may have been made in cases reported, I would refer such objectors to the cases cited by Dr. Reamy. No one can read them and not be impressed with the exceeding care taken to verify his diagnosis by means of the microscope. It certainly is not likely that any of the observers above mentioned would fall into error, or fail unquestionably to establish the diagnosis in any doubtful instance. In all the cases presented in this paper where operative means were used, the diagnosis was verified by the microscope. It was also done in very many of the cases not subjected to surgical treatment.

It was my privilege to see one unreported case of Dr. Sims' nine years after the removal of the diseased mass. There was not the slightest indication of any return of the disease. Of the seven cases reported by Dr. Reamy, one was living and well and to all appearances entirely free from the disease *twelve* years after its removal by operation.

The surgeon who has doubts in regard to the benefits to be derived from operative means in these cases, had better by all means let them alone, as his operation is almost sure not to be followed up to the extent necessary; and his patient will therefore not receive a fair compensation for having undergone it. A return of the disease, of which, under these circumstances, there is every probability, will discourage both.

This naturally leads us to the consideration of a theory which has alike interested the pathologist and the clinical observer for many years, viz., *the local origin of cancer*. In this theory, judging from a clinical stand-point, I am a firm believer. I would not be understood to say that all cases of cancer have a localized development from some source of irritation; for I am sure some cases show a constitutionality from the first. In these, the hereditary tendency is most marked; but even in these a localized irritation is the point which is oftentimes first seized upon to manifest the constitutional taint. But I believe that in the large majority of cases of cancer, some local irritation, oftentimes long continued, is the starting-point of the disease, and that from this the constitution, after a longer or shorter time, becomes affected. In the *Medical Times and Gazette* of London, for January 22d, 1881, there is a most interesting article on this subject by Jonathan Hutchinson, F.R.C.S., which, though written some years before, was first published under that date. The author, by way of illustration in support of his theory, cites cancer of the lip from the constant irritation of smoking; chimney-sweep's cancer from want of cleanliness and irritation of the soot, and other equally forcible examples. I must add that I know of no more frequent cause of cancer of the cervix uteri than the persistent irritation to which the everted lips of a lacerated cervix are exposed; and if the only thing to be gained by Emmet's operation for the repair of such a condition were to diminish the tendency to the establishment of the disease of which this paper treats, I would perform it in every instance where the rupture was sufficient to allow any eversion.

In several of the cases here offered, this cause of the disease was well shown; and in one of them (being one of the two where the wound was closed by silver sutures after the operation), the disease actually developed while the patient was under treatment for an extensive bilateral laceration of the cervix, preparatory to Emmet's operation.

The constitutionality of the disease from the start was markedly illustrated in but one of the cases, and that is so interesting that I report it in full:

Mrs. S. J. consulted me October 25th, 1879. She was thirty-five years of age, had been married fifteen years, and had had four children and one abortion. Her family history on the father's side was good. There was a tendency to phthisis on the mother's side, though the mother herself died of cancer of the womb. The patient had had at no time any severe illnesses, was much more fleshy than formerly, and had complained only nine months. During this time, however, the suffering had been considerable, especially after walking, consisting of backache and of pain beginning in the back and extending over each hip and down the groins. While sitting up, she was comparatively comfortable, nor, until three or four weeks before I first saw her, had driving caused any discomfort. She could not walk or stand, on account of the extreme bearing down thereby occasioned; and, when in the recumbent position, there was much distressing pain, sometimes bearing down in character like labor pains, and sometimes only a weary, aching feeling. The only position approaching comfort, when lying down, was that on the right side with the knees drawn well up. Menstruation began at fourteen years of age, and had been natural and regular, except that latterly the amount had been less than usual. She had suffered from no leucorrhœal discharge. Physical examination showed an ulcer on the posterior lip of the cervix, extending nearly to the vaginal junction, which might easily have been mistaken for one of non-malignant character. There was, however, slightly overhanging the healthy mucous membrane, around nearly the whole of the ulcer, a proliferation of tissue which looked rather suspicious. A portion of it was removed and submitted to Dr. E. G. Cutler, who examined it microscopically and at once decided that it was epithelial cancer (Fig. 3). The patient was etherized November 6th, and, with the assistance of Drs. Cutler, Davenport, and Bates, the posterior lip of the cervix uteri was removed with the uterotome, the incision being carried quite up to the os internum, and the thermo-cautery was applied to the denuded surface. The portion thus cut away was again examined under the microscope by Dr. Cutler, who reported that the entire disease had been removed, as the cut surface looked perfectly healthy. The patient was kept moderately comfortable after the operation by the subcutaneous use of morphine. The chief discomfort arose from the

necessity of maintaining the recumbent position, as previously described. The temperature was 99.5° most of the time. Within a month after the operation, she suffered so much from increased distress in lying down that, in consultation with Dr. F. Minot, a thorough examination of the abdomen was made under ether, which revealed a mass of indurated tissue in the epigastrium, about the size of the fist. It was evidently the appearance of the disease in this locality. A vaginal examination showed no recurrence in the uterus. About the same time, the right leg became edematous, and in a few days the patient returned to her home in Worcester, Mass., where she died February 12th, 1880. The

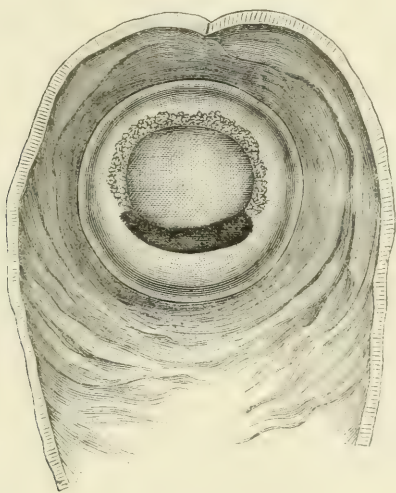


FIG. 3.

following is from an account of the autopsy made by Dr. W. H. Workman, in whose care she then was: "The disease involved, besides the uterus, the lumbar and iliac glands of the right side of the pelvis, and the pancreas. The mesenteric glands were not affected, nor the liver, kidneys, spleen, or stomach. The organs of the chest were healthy. The diseased mass was nodulated and composed of cheesy masses, some of them as large as beans, and surrounded by infiltrated tissue and fat. The disease surrounded and pressed upon the right vena cava and iliac veins.

I should say from its uniform distribution that it commenced at several points, and involved most of the parts attacked at about the same time, as no one part seemed older or more degenerated than another. The largest mass was that felt in the epigastrium, where the glands are most abundant."

Could we feel sure of the constitutionality of the disease in

any given case, we should by no means advise operative interference, as we thereby put upon the patient an added strain to that already existing from the disease, without any hope of its eradication, even though, as in the case just cited, we are able entirely to remove its local manifestation at one point.

There is a popular opinion among the profession that the peritoneum will so protect itself by localized inflammation and lymph formation that there is little or no danger of the peritoneal cavity being opened as the disease advances. This opinion is not, however, verified by clinical experience. In one of the cases here reported, not only was there an opening of the size of a silver quarter of a dollar into the upper vagina from the peritoneal cavity, but also an opening into the ilium, so that there was a constant fecal discharge from the intestines into the vagina through the peritoneal cavity. Moreover, in several other cases, where this cavity was purposely or accidentally opened, the disease was found to have extended quite up to the peritoneal membrane without involving it, and without the slightest evidence of protection from any lymph deposit. The danger from opening the peritoneal cavity has been greatly overestimated. In five of the cases cited, it was either done deliberately, as a necessity in order to remove the whole disease, or accidentally, in my attempts, while operating, to keep outside of it. Yet only once was it followed by any complication, which was a slight attack of pelvic peritonitis. The details of this case are as follows:

Mrs. G. T. F. first consulted me October 15th, 1879. She was forty-two years old, and had been married twenty years. She had had one child thirteen years before; and, within four years after its birth, two abortions had occurred. The patient's occupation was the charge of a sewing-room, and she herself ran a sewing machine for ten years. Her general health had always been excellent. Three years before, she first began to suffer from a bearing-down pain, which still persisted. In addition, she complained of a constant pain in the back and in the left side of the abdomen, sometimes sharp and darting in character, at other times a dragging ache. She also suffered from pain in the left breast and from a pulling about the umbilicus. There had been leucorrhœa for three years, much worse for the year previous to my first observation of the case; the discharge during that time having been yellow, sometimes bloody, but never offensive. Nothing specially abnormal was noted in regard to menstruation. She had been treated for cancer by a homeopathic physician for nearly a year. A section of the disease, removed and examined microscopically by Dr.

Cutler, was pronounced cancer. Physical examination showed the disease apparently confined to the cervix and possibly the lower part of the body of the uterus, the vagina not being implicated. On November 8th, the operation, as previously fully described, was done, Drs. F. H. Davenport and C. P. Strong assisting. In following up the disease, however, into the body of the uterus with the uterotome, after having separated the supravaginal portion, the peritoneal cavity was opened. It was immediately closed with two silver sutures, which were cut off short, and left. Another interesting incident of this case was that, in cutting out the funnel-shaped portion of the body of the uterus, the vascular network just outside the body in the cellular tissue of the broad ligament was cut into. For a few moments, the hemorrhage was so great that the cautery proved quite ineffectual to control it; and tents of styptic iron cotton were used after Sims' method, the remaining denuded surface being thoroughly cauterized. Within forty-eight hours, the patient developed pelvic peritonitis, the attack being ushered in by a slight chill, and the temperature ranging during the next few days as high as 101.5°. Treatment by morphine was carried nearly to the point of narcotism and there maintained until November 19th, when the temperature dropped to 99°. The styptic cotton was removed on the eighth day. It requires to be left so long, because, when applied after searing the denuded surface with the cautery, it seals itself to the eschar so tightly that any attempt to remove it before the slough caused by the cauterization separates, may occasion secondary hemorrhage. There is no danger of septic absorption in leaving it in place for the time mentioned; because the absorbing surface has been destroyed by the cautery, and the iron cotton, under these circumstances, does not become foul. On December 7th, this patient reported at my office, and examination showed a cropping out of the disease as large as a bean, about the central portion of the remains of the uterus. A few days later, under ether, this small epithelial mass was thoroughly removed with the curette, and its base cauterized with the thermo-cautery. The patient remained a few days in bed, and then resumed her work in the shop, where she has since continued to be employed. She has been examined at intervals of one or two months up to the present time, and there has not been the slightest evidence of any further recurrence of the disease.

The point of the operation where the peritoneal cavity is most likely to be accidentally opened is at the upper part of the supra-vaginal cervix, when working with the scissors posteriorly; or when the uterotome is substituted for the scissors in cutting out the conical portion from the body of the uterus, as shown by the line A B in the diagram (Fig. 4), which, under the influence of traction at the time of the operation, becomes nearly straight.

The importance of following up the operation by frequent examinations and by the removal of any subsequent outgrowths or reappearances of the disease, is well illustrated by a comparison of the two following cases:

July 7th, 1879, I was called in consultation by Dr. Samuel W. Torrey, of Beverly, Mass., to see Mrs. Z. H., who was forty-one years of age, and had been married sixteen years. She had had three children, the youngest being eight and a half years old. She had also had one abortion six years before. She gave a good family history, and her own general health had been excellent. For some months she had suffered from a leucorrhœal discharge

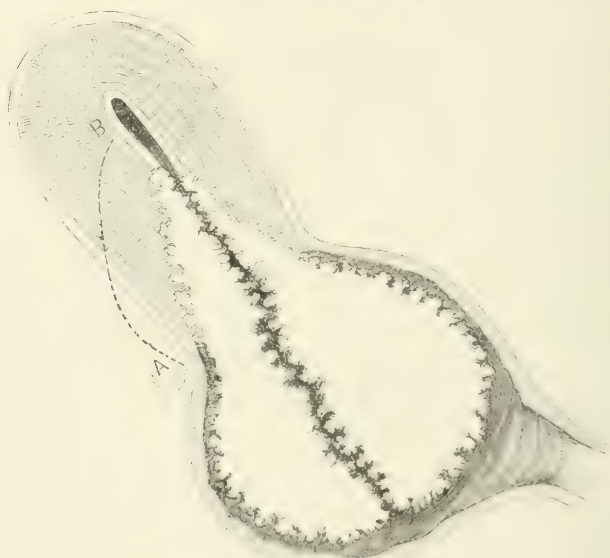


FIG. 4.

which latterly had become excessive and foul. For two weeks previous to the time of my first observation of the case, she had complained of backache. Menstruation appeared when she was fourteen years old, and recurred regularly each three weeks afterwards until within six months, when the intermenstrual period had been shortened a few days. This function was otherwise normal. The bowels were constipated; the micturition was too frequent, and for two months some aching had followed the act. Physical examination revealed epithelial cancer affecting the whole cervix uteri. The patient was etherized July 11th, and, assisted by Dr. Torrey, and Dr. Johnson of Salem, I removed the diseased mass and also a conical-shaped portion from the supravaginal cervix, and applied the thermo-cautery to the denuded surface. Under Dr. Torrey's care the patient made a good recov-

ery from the operation. In the latter part of August, however, he reported that the disease had returned. September 1st, the patient was again etherized. I found the remaining portion of the supra-vaginal cervix thoroughly diseased, breaking down under the touch. The lower portion of the body was also affected and the posterior vaginal wall had become infiltrated. Assisted by Dr. Torrey and Dr. F. W. Johnson of Boston, I performed the operation as fully described in the early part of this paper, removing also a portion of the upper vagina posteriorly, half as large as the palm of the hand, in order to include all the diseased tissue. The peritoneal opening was closed with eight silver sutures and the cautery applied. Dr. Torrey reported a most excellent recovery, the temperature never rising above $99\frac{1}{2}^{\circ}$. He removed the sutures on the eighth day. In March, 1880, he wrote me that there was a slight recurrence of the disease over a space about twice the size of the thumb nail, and that he had urged the necessity of immediate interference. The patient absolutely refused to have anything further done, and died February 1st, 1881, under the care of a homeopathic practitioner, who assured her friends that the disease was nothing more than an ordinary polypus and the operations she had undergone had been uncalled for.

Mrs. A. A., of English birth, was referred to the Free Hospital for Women, October 1st, 1880, by Dr. Belt of South Boston. She was thirty-six years of age, and had had five children and one abortion. Dr. Belt had delivered her three months before, and at that time diagnosticated cancer of the posterior part of the cervix. This was the occasion of a severe hemorrhage two hours after delivery was effected, which was done without the use of instruments. There had been more or less flowing since the labor, varying in amount from two to twelve saturated napkins daily. Clots were frequently discharged. Six months before the birth of her last child, a foul leucorrheal discharge appeared and had since continued. She had not suffered much pain, but complained of a general tired feeling. Menstruation had been normal up to the last pregnancy.

Physical examination showed a mass of epithelial growth so nearly filling the vagina that it was impossible to determine how extensively the surrounding parts were affected. I felt tolerably confident, however, from the movability of the whole mass together with the uterus, that the cellular tissues of the broad ligaments were not implicated. The patient was etherized October 7th, and a considerable portion of the upper posterior vaginal wall was found involved in the disease. The operation was performed as previously described, the whole of the disease as detected by the touch and sight being removed. The large opening into the peritoneal cavity was closed with a continuous silver suture. The day following the operation the temperature rose to 103.5° and the pulse to 120; but both became normal on the fourth day, and remained so for most of the time afterwards. The recovery was good, the patient being up on the seventeenth

day. Within two months there was a slight cropping out of the disease, which was at once removed and its base cauterized. She has been examined each month since and remains perfectly well. She menstruates very slightly. The uterine cavity was measured last June and found to be barely three quarters of an inch in depth, showing that a considerable portion of the body of the uterus had been removed.

In these two cases, I see no good reason why as much might not have been done for the first as for the second, if, the great part of the work having been already accomplished, we had been allowed to follow up the disease by a very simple operation.

When the disease is limited to either part of the cervix, the whole cervix should be removed on account of the greater tendency to return quickly in the remaining portion of the lower segment of the uterus. This has been my experience in three instances, and is also shown in one of the cases figured in the article by Dr. Sims, before referred to. The following case well illustrates my point :

Mrs. S. J. consulted me Jan. 30th, 1880. She was fifty-five years of age, and had been married thirty years. She had had two children, aged twenty-six and twenty-five years respectively. There had been five abortions, three of them occurring before the birth of any child, and two after the birth of the younger: some of them had resulted accidentally and others were procured. Her family generally were long-lived. Its history showed a tendency to rheumatism. One sister had died of "cancer of the bowels." The patient's own general health had been good. Menopause occurred nine years before. Two months before she consulted me, while taking a vaginal douche, she saw blood returned in the water of the injection. Greatly alarmed, she consulted her physician, who told her there was a "small growth, smooth, round, pink, and the size of a green grape, just on the lip of the os." He advised its removal, to which end applications of caustic were made for some time, but without effect, save that every interference caused bleeding. A specialist was called in consultation, and her condition was spoken of so guardedly as to lead her to fear malignant disease. She had suffered no physical pain, but her anxiety had been very great. There had been no leucorrhœal discharge whatever till within six months; and during this time only very slight in amount, though occasionally faintly streaked with blood. From a portion of the growth examined by Dr. Cutler, an undoubted diagnosis of cancer was made. Jan. 31st, 1880, the patient was etherized; and, assisted by Drs. Davenport and Smith, I performed the operation as described, except that I limited it to the posterior half of the cervix and lower part of the body of the

uterus. The patient made a good recovery, with the exception of an attack of acute cystitis. The temperature never rose above 99°. On June 30th, the anterior portion of the cervix, which had been left, offered the same appearance formerly present posteriorly, though less extensive. Under ether, the operation was repeated anteriorly. The recovery was uncomplicated. The specimens removed were each time submitted to Dr. Cutler and pronounced cancer, though he was not quite sure after the first operation that the whole disease had been removed, as the affected portion infringed so closely upon the cut surface at one point. The patient has been examined each month or two since, and there has been no evidence of any return of the disease.

Why there should be a greater tendency to its recurrence in the remaining portion of a cervix has greatly interested me. The only explanation I can offer is, that the contracting cicatrix about the remnant of the cervix tends to strangulate it, thereby interfering materially with the venous return. A passive congestion results, which, together with the friction of the vaginal walls upon the hyperemic cervical membrane of the remaining portion, keeps up a constant irritation upon an unprotected surface, precisely what we oftentimes see in an extensive bi-lateral laceration of the cervix uteri.

Although unable always to remove the disease entirely, much may be done, as Dr. Sims has shown, for the comfort and temporary relief of the patient. All sloughing tissue and vascular excrescences may be removed with the curette; and this, followed by the thorough application of the thermo-cautery, will render the condition far more endurable.

Mrs. F. J. consulted me in September, 1879, on account of a profuse leucorrhœal discharge of a year's standing. This she described as very offensive and variable in color, being sanguineous, yellow, or greenish. In spite of three or four vaginal injections daily, constant protection was necessary. Her husband complained that this discharge had occasioned him an attack of urethritis. She was forty-seven years old, had been married twelve years, had had one child nine, and one abortion seven, years before. The family history showed phthisis on the father's, and cancer on the mother's, side. For four months she had suffered a great deal of pain in the left side, extending through to the small of the back. Exercise greatly increased the pain. Although a woman of a great fortitude, it would often tire her out completely. At such times, an additional pain seemed to extend down the legs, even to the ankles. The full extension of the legs caused great pain in the abdomen. Any attempt at coitus invariably occasioned a flow of blood. Cachexia was well-marked. Nothing

abnormal was noted in the menstrual history. A physical examination revealed the uterus fixed, and the whole left broad ligament and vaginal cul-de-sac of the same side thoroughly infiltrated with the disease, while the whole cervix uteri had sloughed away, leaving a considerable excavation into the body of the uterus. The vaginal walls in the whole upper half were implicated, and were sloughing wherever the disease approached the cervix. The patient was etherized Oct. 16th, 1879, Dr. Davenport assisting. The operation advised for cases in which it is found impossible to remove the entire disease was done. For about two months the patient was wholly free from any discharge, and was greatly relieved from pain, which, however, still persisted to some extent in the left hip. After that length of time, both the discharge and the pain gradually returned. She was disheartened and would have nothing more done, which, in her case, could certainly not be urged. She died in July, 1880.

The advantages claimed for the method of operation described in the early part of this paper are:

1. More of the uterus can be removed than by any other previously described method where any of it is left.
2. All subsequent disturbance of the patient for the changing or removal of dressings, or for examination of the parts, is unnecessary until complete convalescence is established.
3. The operation is less severe, and consequently accompanied by less danger, than any of those for the removal of the whole organ.
4. The steps of its performance are more simple and easy than in those operations where the total extirpation of the organ is practised. It is, therefore, more practicable for the general surgeon.
5. The length of respite from the disease is greater than in any cases known to me where the entire uterus has been removed.

In review, I would present the following:

1. In all uterine cases, do not neglect to remove all sources of local irritation, especially lacerations or frictions of the cervix uteri with eversion.
2. Make an early specular examination of all cases presenting any of the rational signs of cancer.
3. In all doubtful cases make the diagnosis positive, if possible, by a microscopical examination of a section removed.
4. The diagnosis of cancer established, do not delay the operation, which must be thorough, removing if possible every por-

tion of the disease, though it be necessary to open the peritoneum or the bladder to accomplish it.

5. Submit the portions removed to the microscope to be absolutely sure that all the diseased tissue has been cut away.

6. When necessary to remove any part of the cervix, remove the whole, infra- and supra-vaginal.

7. Make a specular examination of all cases operated on, every month or two for some years; and if any reappearance of the disease be discovered, do not delay the use of the sharp curette and the thermo-cautery.

8. Do not attempt a radical operation where there is evidence that the disease has been constitutional from the start, or where it has become so by a too long delay of its primary performance.

ON THE MENSTRUAL WAVE.

BY

WM. STEPHENSON, M.D.,

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IN her prize essay "On the Question of Rest for Women during Menstruation,"¹ Dr. Mary Putnam Jacobi has published a series of observations which form a most valuable contribution to our knowledge of the subject of menstruation. They are comprised in six tables, giving the daily record of pulse and temperature, together with the amount of urea excreted, of six persons for periods of one, two, or three months. There are also a number of sphygmographic tracings. The author thereby confirms the view which has been partially indicated by several writers, and especially advocated by Dr. Goodman,² of Louisville, that there are rhythmic waves of nutrition which rise and fall in monthly periods. The results derived from the observations she sums up in the following words: "We find that, in the majority of cases, the excretion of urea is increased during the few days preceding menstruation, over that of the

¹ London, Smith, Elder & Co., 1878.

² "The Cyclical Theory of Menstruation." Oct., 1878, of this JOURNAL.

intermenstrual period; that it decreases during the menstrual flow, and is at its minimum just afterwards; that the pulse shows no uniform rate of variation, but that the temperature rises just before menstruation, to fall during the flow, but at this time rarely reaching the point of the intermenstrual period. Finally, that the sphygmographic trace shows a constantly increasing rise of arterial tension from a minimum point reached just after menstruation to a maximum point just before, but rapidly lessened during the menstrual flow" (p. 162).

The mode of analyzing the data which Dr. Mary Jacobi has adopted does not permit of a more definite statement, and whilst affording proof that such a wave of nutrition does exist, leaves it to be desired that, by other means, the actual form of the wave could be accurately determined. Without this, the subject cannot be discussed with anything approaching to scientific accuracy. By the method of analysis I propose, I hope to be able to show that the various curves can be graphically projected, so that one part can be measured by another, and the position which menstruation occupies in relation to the wave thereby determined. It will also be seen that there are various inaccuracies in the statement I have quoted, and that the theory advanced by Dr. Jacobi is not supported by her observations.

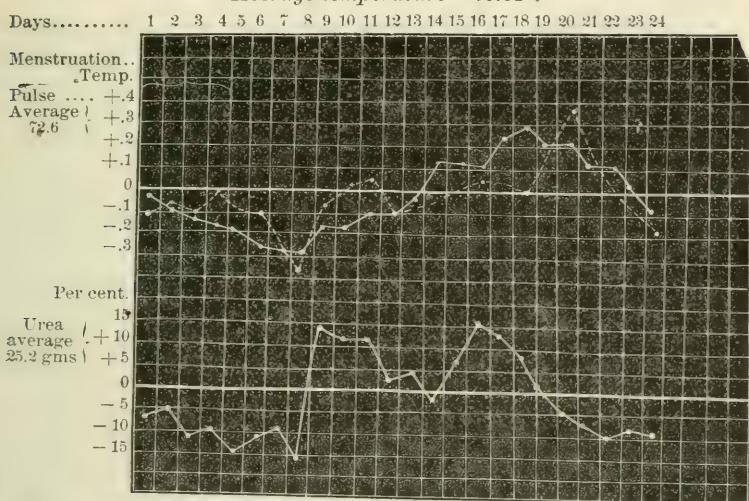
There are various difficulties to be contended with, and precautions to be used in conducting an examination of this kind. The data, although more numerous and continuous than we have before possessed, are yet scanty for the delicacy of the work, and the mode by which they can be used. Taking the temperature, when it is seen that the variations in the wave do not amount, in any of the cases, to a degree (F.), it will be understood how readily and frequently the numerous disturbing influences, which are always at work, may obscure the true curve. In calculations of this kind, it is by increasing the number of the data that such disturbing influences can be neutralized; but here the numbers of all the cases cannot be thrown together; each case must be analyzed by itself. It is, moreover, necessary in each case, first to determine the character and duration of the waves singly, before adding them together to get an average; otherwise, we may be adding the depression of one wave to the elevation of another, and so neutralizing both. But from the necessity of analyzing each case singly, an advantage is gained. If the separate results show a marked similarity

one to the other, the truth is more reliable than that from only a single result obtained by adding all the cases together. This, it will be seen, is the case in the present inquiry.

Four only of the six cases will be given in this paper. All have been examined; but in No. 1 there are breaks in the record of temperature which render it unserviceable. In No. IV. there was a disturbance in the general health, menstruation occurred unexpectedly after an interval of fifteen days, and thereafter the temperature rose to a febrile degree (102°). It is advisable, therefore, to discard it also for the present. It

CASE A.—Average curve of three Menstrual Periods of 23 days each.

Average temperature = 99.31° .



may be remarked, however, that nothing was found in them contradictory to the results from the other cases.¹ The temperature observations are those taken in the rectum.

METHOD OF ANALYSIS.

Temperature.—The first step is to obtain the daily averages. As there were, except in Case A, only two observations taken each day, the average of these two numbers would not be very reliable. We want some means of diminishing the effect of disturbing influences. This may be done by what is known as Bloxam's method. The average of three days' observations is taken as the mean for the middle day. Thus, as the average for June 17th is taken, the mean of the observations of the

¹Case A in this paper is No. III. of the essay, B is No. VI., C is No. V., and D is No. II.

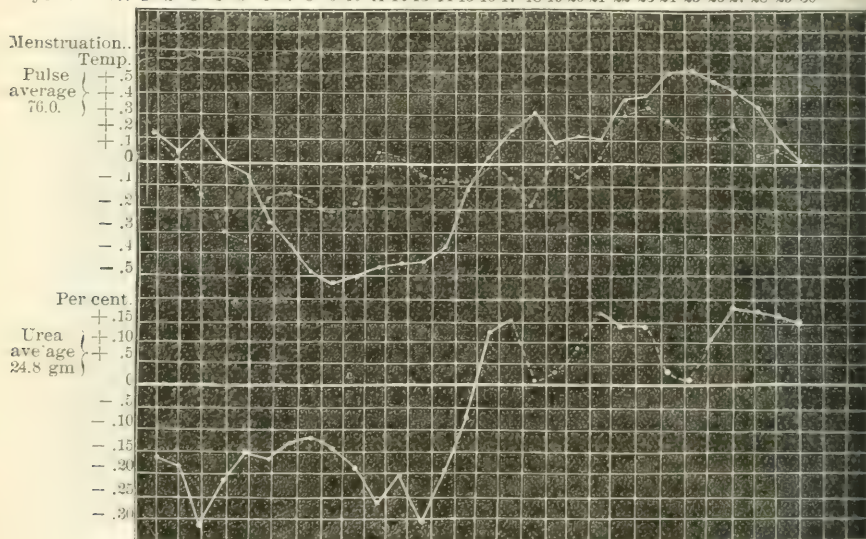
16th, 17th, and 18th; for the 18th, the average of the 17th, 18th, and 19th, and so on.

Having in this way ascertained the average temperature for each day, the *total average* is next obtained by adding up all the daily averages and dividing by the number of days. Each day has now to be compared with this total average, and according as it is above or below, the difference is represented as plus or minus. Thus, in Case A the total average is 99.31° ; the average for June 22d is 99.11° , which is .20 below the total average,

CASE B.—Average curve of two Menstrual Periods of 30 days.

Average temperature = 99.66° .

Days. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

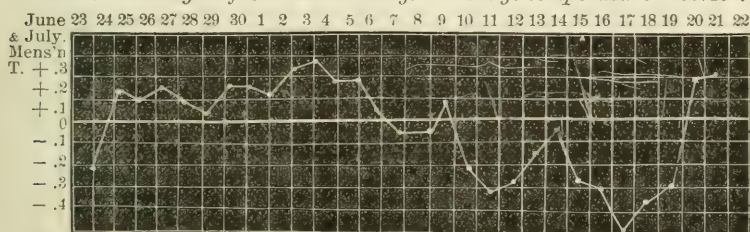


and is therefore regarded as $-.20$. For July 31st, the average is 99.86° , or $+.55$. In this way, a relative value is obtained for each day.

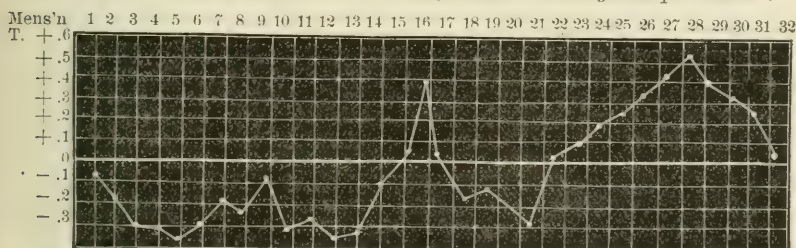
To project the curve, a chart is taken ruled with vertical columns representing the days, horizontal lines are drawn to give a scale of tenths of a degree. If the temperature were constant throughout the month, it would be represented by the straight line corresponding to the height of the temperature; but as it, at times, falls below the average, and, at others, rises above, its true representation is the line joining the points for each day. The total average temperature is the zero line, and each day's average is represented in its own column, as a minus below, or

a plus above the zero line. In this manner I projected the curve for each case, throughout the whole period of observation. Examining then the nature of the curves, it was found for Cases A and B that the waves in each were of uniform length, and corresponded so closely that the first day of menstruation might be taken as the starting point of each wave, and that the separate waves might be superimposed one on the other, that is, added together, and the disturbing influences further got rid of. An average curve was thus obtained, of three waves in Case A, and of two waves in Case B. It is these average curves that are given in the plates. In Case C, the observations lasted only

CASE C.—*Averages of One Month only. Average temperature = 99.46°.*



CASE D.—*Average of two waves of 32 days each. Average temp. = 99.20°.*



one month; the curve therefore represents a single daily average. In Case D, the observations embrace two months, but the second wave is a day longer than the first, reckoning from the beginning of menstruation; but, taking as the beginning of the waves the day when the temperature was at the average, it was found that the waves were of equal length of thirty-two days each. The one wave was then superimposed on the other, and an average curve obtained.

Urea Curve.—In the tables, the amount of urea excreted is not stated for each day. Generally it is given for alternate days, but sometimes there is a blank of two or three days, and, again, several successive days are given. This irregularity pre-

vents the same method being adopted as with the temperature. The following plan was substituted in Cases A and B, in which alone the observations are sufficiently numerous, and extended over a succession of months to afford reliable results. In Case A, there are observations extending over three monthly periods and part of a fourth. The waves are twenty-three days in length, and are reckoned from the beginning of each menstruation. A paper was ruled with twenty-three columns representing the number of days in the wave. In the first column were noted the data found recorded for the first day in each of the three waves; in the second, the data for the second day in each wave, and so on for all the twenty-three days. In this way two, three, and in some cases four separate observations for each day were obtained. Five days only of the twenty-three had single observations.¹ Each column was then summed up, and the average for each day determined by Bloxam's method; in this way, from four to ten observations were included in each average. The total average for the month was next found, and the daily averages compared with it as before. For Case A, the total average is 25.2 grms. urea, the further decimals being discarded. The amount for the first day is 23.4 or 1.8 below the total average, equal to -7 per cent.² The amount for each day is similarly calculated; for the second day, it is -5 per cent; for the third day, -11 per cent, and so on. The curve can now be projected as before, and is figured in the plates. For the other two cases the observations are unfortunately too few or irregular to give reliable results after the same method.

Pulse.—The pulse data I have treated in the same way as the temperature, and the results are given for Cases A and B in the dotted lines on the charts.

The sphygmographic tracings do not admit of any numerical comparison. To render them capable of such treatment, it is necessary that there should be given the exact amount of the pressure which yields the best tracing or the working pressure, and also the obliterating pressure. Were these stated, as should always be the case, a means of comparison would be afforded.

¹ In Case B, the dotted portion of the curve is from single observations, and therefore not so reliable as the rest.

² The percentage calculation is to be preferred in all cases of this kind. With the temperature, the numbers are so close on the hundred that they also truly represent a percentage.

such as cannot be obtained by an examination of the tracings alone. In addition to the remark regarding arterial pressure, already quoted from the essay, I would further quote the statement made on another page, "that the arterial tension is sometimes higher *six or seven* days before menstruation, than it is on the day or two immediately preceding." This closely corresponds with the apex of the temperature wave.

As before remarked, the great similarity in the results of the separate analysis of the four cases increases the confidence with which they may be accepted as representing a great truth. None of the curves can be taken as giving the real *constant* of the menstrual wave, but they supply a very important first step in that direction. The following conclusions are warranted by an examination of the various curves:

1. That menstrual life is associated with a well-marked wave of vital energy which manifests itself in the temperature of the body, in the daily amount of excretion of urea, and to a slighter extent in the pulse rate.

2. That the cycle of changes takes a true wave form, divisible as to time into two nearly equal parts, the one below, the other above the average for the whole period.

3. That the length of this wave varies in different individuals, and may vary also in the same person. The urea wave and the temperature wave are equal in length in the same case.

4. That menstruation does not correspond with the apex (or "climax") of the waves, but occurs five or six days after the decline has begun. It is probable that normally it occurs when the temperature curve reaches the mean; this was the case in nine out of ten menstruations. The flow or evacuation cannot be regarded as the cause of the decline.

5. That the temperature wave is the most uniform and gradual in its rise and fall. In the urea curve, the transition to elevation takes place more quickly, even suddenly; in Case A, it rises in twenty-four hours from -15 to $+15$ per cent.

6. That the temperature wave and urea wave are independent of each other; for whilst in one case they are exactly synchronous, in the other, the urea wave is four days in advance of the temperature wave.

7. That whilst the pulse wave is not so marked in character, it also shows a decided influence; it is depressed after menstruation, and manifests a distinct rise some days before the next period.

8. In all the waves there are evidences of secondary waves. This is seen in the temperature just after the rise above the mean, and the explanation of the irregularity in Case D may be that this secondary wave is separated from the primary, and stands out more distinctly. The sudden elevation which characterizes the urea wave may be due to the influence of two waves. From a different analysis of the pulse curve, I am inclined to believe that it has an independent wave of from five to six days' duration, and on this wave is superimposed the menstrual wave which causes the depression and elevation already noticed.

Further than this we cannot at present go. I would urge a restraint being put on the great tendency of theorizing in advance of our knowledge. It is too early yet to form a theory; but if the above results are accepted as indicating the scientific relations of menstruation more clearly and accurately than before known, they may be used as a test of our previous opinions, and many of these will be found to require correction.

ANTE-PARTUM HOUR-GLASS CONTRACTION OF THE UTERUS.

BY

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WHILE the title given to this paper may be objected to by some, I think it clearly calls to mind the condition it is intended to describe; hence its adoption. Other names, used by other observers, are open to the serious objection, that the condition named therein attempts to describe a state of the parts which is not admitted to be correct by pathologists generally, and, in fact, is stoutly denied by some of the most able practitioners who have had the care of cases where this distressing obstruction to the termination of labor has existed. For instance, Dr. A. Hosmer, of Massachusetts, calls it "A Peculiar Condition of the Cervix Uteri which is found in Certain Cases of Dystocia," while Dr. R. P. Harris (in Playfair) entitles it "Tetanoid Falciform Constriction of the Uterus."

I would describe the cause of the dystocia in these cases to be a circular contraction of a limited portion of the muscular fibres of the uterus above the internal os, occurring during labor, whereby some part of the fetus is tightly embraced, and preventing the progress of the child during the contractions of the uterus. My reason for thus placing the obstruction is, that an effort has been made to prove that the os internum is the active agent in producing this form of difficult labor, which, I believe, will be shown to be erroneous by the cases to be cited. This preliminary statement seemed to be called for before proceeding to report the case which induced me to prepare this paper.

CASE I.—Mrs. B., primipara, age 26, very short in stature (under five feet), but otherwise well-developed, sent for me on the morning of the 23d of December, 1881, at 8 o'clock. She had been having pains all night. The membranes had ruptured, and the waters had been slowly passing off for some hours. I should have stated that, during the whole period of pregnancy, Mrs. B. had enjoyed excellent health; had not suffered at all from nausea; appetite and digestion had been good; kidneys had acted well; no swelling of the limbs. She had taken a great deal of exercise during the whole period of gestation.

On examination, the os was found to be soft, and dilated to the size of a silver half-dollar, and a female child presenting by the breech, the back being to the left sacro-iliac synchondrosis. The amniotic fluid was escaping gradually, and the vagina was well lubricated. Pains were recurring about every ten minutes, and were of the character usually observed in the first stage of labor. The next examination was made two hours later, the os being still more dilated and the pains occurring oftener. At 12 o'clock *M.*, expulsive pains commenced and continued at short intervals and increasing force until 4 *P.M.* At this time, the os was well dilated, and the soft parts moist and of good temperature. Still the child had not advanced a particle. The pelvis was of normal proportions, and no cause for the delay was apparent. Waiting for a pain to come on, I observed that, while contractions were very strong over the fundus, the presenting part of the fetus was scarcely depressed thereby, and did not engage in the brim of the pelvis. The patient now asked for chloroform, and I allowed her to inhale a mixture of chloroform and ether, which she took very nicely, and was soon under its influence.

Believing that I might facilitate labor by making traction with the finger in the groin of the child, I passed my hand slowly into the vagina, and through the open os until the groin was reached. On making traction, my disappointment was great to find that all the force that could be brought to bear, did not even start the breech down into the pelvis, although it was freely movable. I

then determined to bring down the feet. No difficulty was experienced until the ankle of the child was reached; then a resisting band was discovered, which at first was thought to be the crest of the ilium. On attempting to pass my hand beyond the stricture, so tightly was it grasped that it could not be used to seize the foot. By permitting the hand to remain quiescent for a while, the stricture seemed to yield to a very slight extent, of which fact I availed myself, and grasped the ankle. After repeated efforts to cause the limb to sweep over the abdomen of the child, in all of which I was defeated, I withdrew my hand, and, after resting, passed the blunt hook over the child's groin, and made traction until satisfied the tissues would yield if more force was exerted. Deeming assistance necessary, as my hands and arms were practically paralyzed, and every effort to deliver the child frustrated, I requested that Dr. Jos. Taber Johnson be sent for to help me. The doctor responded promptly, and, after receiving from me a report of the case up to the time of his arrival, made a careful examination. He then directed my attention to the extent to which the constricting band, referred to above, involved the uterus. On relieving the doctor, who had vainly tried to bring the feet through the obstructing tissue, I found the constriction to pass entirely around the uterus at a point level with the umbilicus of the mother, and feeling like a cartilaginous ring, having a very sharp edge. This was found to be undilatable by any force which we could apply through the hand. Repeated and persistent, though unavailing efforts were made by both of us for more than an hour, relieving each other in turn as our hands were incapacitated by uterine pressure. As I said before, the waters had drained off, while the uterus was firmly contracted above the constriction, and dilated and relaxed below. The tissues of the uterus below the stricture were not thinned to any appreciable extent.

Having assured ourselves that the child was dead, it was determined to try the blunt hook again. In this I succeeded, (although the tissues of the child were torn by the point of the hook), and brought down the breech and lower extremities beyond the vulva. At this stage Dr. Johnson relieved me, and, after a great deal of force had been expended, aided by pressure on the child's head, through the abdominal wall, delivery was finally effected. The child weighed about seven pounds. On introducing the hand, the placenta was found to be detached and the stricture gone. There was no hemorrhage. The patient was under the influence of the anesthetic over two hours, and notwithstanding the prolonged manipulations attending the efforts at delivery, she recovered with no other unpleasant symptom than incontinence of urine of a few days' duration.

About three weeks after confinement, I examined Mrs. B., with a view to ascertain if any contraction of the pelvic brim existed, which had had anything to do with the dystocia, and which might cause trouble in any future labor, but nothing was found to en-

courage such an impression, nor were the soft parts found to have suffered serious damage from the violent efforts made to secure delivery.

It will be seen that ample time was afforded to enable the uterus to expel its contents, if no obstruction had existed; that the stricture failed to relax after the patient had been deeply under anesthetic influence two hours; that no manual orce was sufficient to dilate the constriction; that the presentation of the breech did not make the efforts at delivery much easier than in cases where the vertex presented; and, finally, the high position of the stricture and the thickness of the "lower uterine segment" demonstrate that the stricture was not at the internal os uteri.

The extreme rarity of cases of this character is demonstrated, not only by the absence of reference to the subject in text-books on obstetrics, but also from the expressed opinions of eminent obstetricians, by whom cases have been seen, generally in consultation. Dr. Baltzell, whose case is the first I have been able to find, and which will be cited in full further on, says: "I have never read, heard, or met with a similar case in the course of my obstetric practice, nor did it ever occur to my apprehension that an irregular contraction of the uterus of such a character might frustrate its functions in the expulsion of the fetus.*" Prof. T. A. Reamy concludes the report of his cases as follows, referring to the "rareness of this complication of labor:" "Its rarity may be seen by reference to the fact that not a case occurs, as far as I am aware, in the reports of either the London or Guy's Hospital since the foundation of these great charities." Dr. J. R. Moore testifies: "This is the first instance where I have known this form of contraction to exist before delivery of the child, and, indeed, can find nothing in obstetrical literature which bears directly upon this point." Dr. L. P. Stiles: "I know of no similar case occurring, and, on comparing notes with a number of the physicians of this place (Leavenworth, Kan.), I found none who have ever met with hour-glass contractions before the delivery of the child." Dr. Angus Macdonald, of Edinburgh, concludes that "the accident is very rare; indeed, in my experience, unique, in connection with the first stage of labor." This testimony is sufficient to establish the fact of the

rarity of the complication, and I will only state that, so far as my information extends, the only text-books in which reference is made to the subject are Blundell (ed. 1840, p. 166), who, speaking on the subject of turning, says: "In these turning cases, you will sometimes meet with a third obstruction, consisting in a *circular contraction* of the middle of the womb, dividing it, as it were, into an upper and inferior chamber; part of the fetus lying in both." And Playfair, who, in the third American edition, refers to the subject, after his attention had been called to it by a section introduced into the second American edition by the editor, Dr. R. P. Harris, testifies that *he* has no personal experience in the management of such cases.

Form of the stricture.—Hosmer likens the stricture to a band of metal; Davis, "as if a strong rope had been tightly drawn around it" (the uterus), and Gay says "it felt as hard as bone, and at first was mistaken for bone." Another says it felt like a silk thread beneath the mucous membrane. Others call it a firm band of circular fibres, etc.

Power of the constricting tissue.—I have stated in the report of my cases that my hand was rendered useless by the stricture contracting upon it. Dr. Reamy says: "Nothing which I had ever encountered in uterine contraction could convey any idea of the power of this constriction. Having succeeded in penetrating beyond it alongside of the shoulder with two fingers, I willingly withdrew them, so painful was the grasp. If the constriction had encircled the neck of the child, it could not have survived longer than if it had been suspended by a noose around the neck." Dr. Gay found that the "contractile power was so forcible that the pain inflicted upon the wrist at each uterine contraction was almost insupportable." Dr. Edwards (Dr. Reamy's second case) describes the effect of the constriction on the child as follows: "The child presented a remarkable appearance. The scalp, face, and trunk, to below the umbilicus, were livid, while the inferior portion was very pale; just below the umbilicus, at a point seized by the constriction, the body of the child was nearly cut in two. The spine, muscles, viscera, integuments, and cord were all compressed to a diameter of one and a half inch, and remained thus, or with very little expansion, after delivery." The diffi-

culty incident to overcoming the obstruction, and testimony of those who have met with this form of difficult labor, will appear in the recital of the cases.

Location of the stricture.—It would seem to be a work of supererogation to devote much space to the consideration of this branch of the subject, and it would not be ventured upon were it not that, as will appear, this is the principal point towards which attention is being directed in the profession; and, although I am wedded to no special views or theories, I feel compelled to differ with several gentlemen who have recently expressed themselves on the subject, and whose teachings, I believe, are not borne out by the facts which will be brought out by the relation of the cases presently to be cited. Reference is made especially to the contributions of Dr. A. Hosmer, to whom is due the credit of urging the subject upon the notice of the profession through the columns of the *Boston Medical and Surgical Journal*, and to which Dr. Harris called the attention of the medical world by his editorial notes in *Playfair*. Dr. Hosmer believes the constriction to be the internal os uteri, and predicates his belief on the researches of Bandl. Dr. H. already has a following, as is evident from several contributions to recent medical literature, notably Drs. Stone, Briggs, and Bradley. Now, there would be less objection, perhaps, to Dr. Hosmer's position if Bandl's views had been substantiated by other investigators. It is necessary that some explanation of Bandl's opinions should precede the relation of cases, inasmuch as the points in controversy cannot be made apparent without so doing. I regret, however, that I am compelled to take from others the statement of the views of the German teacher, but believe the following to be a brief summary of the essential points involved.

Bandl claims that, in the latter months of pregnancy, a new cervix uteri is formed, into which enter as factors the lower segment of the uterus, the upper part of the vagina, and the cervix uteri proper; the latter, however, occupying a very subordinate part in the new cervix. As gestation advances, this newly-developed cervix is gradually made to take part in the development of the cavity of the uterus; that it is capable of immense distention, not only horizontally, but likewise longitudinally, and that it may in labor attain a length of nine

inches, and, that the stretching is so great that the fetus is readily felt through the abdominal wall and attenuated cervix. Now, Dr. Hosmer bases his explanation upon this hypothesis (although he seems to be inclined to modify his views in his latest article). It is manifest that the adoption of this theory will rehabilitate the now generally exploded teachings of the older obstetrical writers, in regard to the changes of the cervix uteri during pregnancy, and relegate the modern teachings worked out so admirably by Duncan and others, to the "Tomb of the Capulets;" but, fortunately, so astute an observer as Dr. Angus McDonald, of Edinburgh, has thrown himself into the breach, and, by almost unanswerable logic, backed up by pathological specimens of invaluable worth, demonstrates that Bandl's cervix is "conspicuous only by its absence." I commend a careful perusal of Dr. McDonald's article in the fourth volume of the Transactions of the Edinburgh Obstetrical Society, 1878, p. 330, by those who are inclined to accept the views of Bandl. Further on, this subject will be again considered in the light of post-mortem and clinical facts brought out by the investigation of the cases recorded, and to which I now invite attention.

CASE II.—This is the earliest case I have found recorded, and is found in the Philadelphia *American Medical Recorder*, vol. 4, 1821, under the following title: "An Extraordinary Case of Difficult Labor communicated by J. Baltzell, M.D., of Fredericktown, Md., in a letter to Prof. R. W. Hall, of Baltimore." After his reference to the rarity of the case, which has been quoted above, the doctor proceeds: "On Tuesday, the 24th of October last, in the afternoon, I was requested to visit Mrs. N., and was informed that she had been taken with labor on the preceding Sunday evening, that the liquor amnii had passed off with the first slight irregular pains and as the head of the child did not advance, it was deemed expedient to call in the family physician without delay; that the presentation was right, but the pains were not sufficiently strong to propel the child, and it was apprehended that there was want of space, owing to a defect of form. Means had been applied to excite the throes of the uterus, and it was hoped that they still might, if rendered sufficiently active, accomplish the delivery. The pains had ceased altogether, and she had had a convulsive fit some short period before I saw her. I found her in a state of stupor, with considerable mental derangement. The attending physician informed me of the means he had employed, and that they had all proved unavailing. On examining her situation, I discovered the os tincæ fully dilated, with the head of the child

down in the basin of the pelvis, and was convinced that the labor was not impeded by any malformation of its structure. It appeared evident to me that, from the shock the vital powers had now received from the convulsions, it was necessary, in order to preserve her life, that the delivery should be effected with all possible dispatch, and I therefore recommended the application of the forceps. In the mean time, however, as her pulse was much depressed and a great prostration of her system had taken place, it was thought proper, with a view to prevent the recurrence of convulsions, to rouse her by administering some nervine stimulants. Repeated attempts were then made with the forceps to extract the fetus, but they were all fruitless. The head would seemingly yield a little, but by the continued application of force, the cranium would give way and slip from the blades. On examination afterwards, it was discovered that the head occupied the same place as before. Being satisfied that the delivery was impracticable with instruments, I introduced my hand with a view of turning the child and delivering by the feet: but, to my utter astonishment, I reached a part so tightly inclosed with the uterus, that with the utmost exertion of my hand I could not pass my fingers between it and the body of the child. It then, also, appeared to me that when the head seemingly yielded to the force of the forceps, it was the uterus with its contents that was drawn down towards the pelvis, and, what surprised me after all these attempts, the contraction now extended itself in an increased degree to the os tinæ. I then suggested the abstraction of blood, by copious venesection, to relax the system, and to embrace the moment of its immediate effect to extract the fetus with the forceps. This also failed. On the following morning, bleeding was resorted to a second time, but with a like failure in repeated efforts. From manual examination and combined circumstances, I inferred the case to be what is usually termed the 'hour-glass contraction,' met with sometimes in the retention of the placenta, but never heretofore apprehended by me as a cause of failure in delivery. From the prostration and exhaustion of the system and the repeated recurrence of convulsions, I considered the case beyond the reach of human means of relief, and that evening, about seventy hours after the commencement of labor, she expired. The lady was in the prime of life, of low stature, and extremely fat and corpulent, and of a healthful constitution. This was her first pregnancy, and her health was unimpaired during gestation.

"The singularity of the case and its sad catastrophe induced her afflicted relatives to desire a dissection of the body, to ascertain the real cause of the fatal issue. The attending physician and myself accordingly opened her body about four hours after her decease, and examined the state of the uterus. We found the deductions I had made from the manual attempts entirely confirmed. The uterus was elongated, forming a tight case over the breech of the child, which felt hard to the touch through the

external integuments. On opening these, and cutting into the part, some excessively noisome effluvia escaped, evidently produced by incipient putrefaction. It was closely contracted on the body of the child, presenting inequalities correspondent to its shape. It occupied the right side of the cavity of the abdomen, pressing the intestines to the left. Near the neck and shoulders of the child, the uterus had the appearance as if a circular band, about half an inch wide, had been forcibly drawn around it. The stricture was accompanied with a prominence on each side, forming as it were a groove in its course around that part of the uterus. It was this which I felt in endeavoring to pass my hand over the back and shoulders of the child. The fixed and forcible contraction, as with a cord, bound fast the fetus, and presented an insurmountable barrier, defying all the efforts that were used at delivery."

No apology is deemed necessary for introducing this case in full as reported. Aside from its intrinsic merit, it is to be commended for the skill with which the treatment was applied and the careful manner in which details have been observed in recording the symptoms and the results of the autopsy. It may be said to be a typical case. The elongation of the uterus, referred to, appears to have involved that portion above the stricture—not that below it. In other words, there was no excessive stretching or thinning of the cervix, but, on the contrary, if any part answered to that description, it was the fundus.

As it is my purpose at this time to show that the os internum is not to be looked upon as the cause of obstruction, although I am not willing to assume that it never acts as the obstructing element, cases will be presented bearing directly on this point.

CASE III.—This case was seen in consultation by Dr. Gay, and his paper will be found in the Proceedings of the Buffalo Medical Association (*Buffalo Med. and Surg. Jour.*, 1870-71, vol. 10, p. 218).

The patient had had five or six difficult labors, giving birth to still-born children. Had been in labor forty-eight hours. Vertex presented; forceps would not retain hold on the head. Craniotomy was performed before Dr. Gay arrived. Dr. G. proceeded to turn, and "seizing the foot of the child, he found he could not bring down the foot, nor withdraw his hand, on account of the constriction of the circular fibres of the muscles of the uterus." With the blunt hook the leg was drawn down. Any effort to remove his hand from the uterus excited such "strong muscular contractions that it became impossible while the hand was closed;

by opening the hand he was able to remove it." "The constricted portion of the uterus appeared to be the size of a rope one inch in diameter; felt as hard as bone, and at first was mistaken for bone, but observing its contraction and dilatation, the character of the tissue was determined." "While the hand was in this trap, he declared to his associates that he had hour-glass contraction, and took time to study the relative position of the uterus and its contents." "He found that . . . the uterine contraction was not that of the os uteri, but existed above it. In this he could not be mistaken." The conjugate diameter of the pelvis was not more than three inches, caused by the projection of the promontory. The mother recovered.

The emphatic manner in which Dr. Gay expresses his opinion as to the nature and location of the contraction is entitled to great consideration.

CASE IV.—This is, perhaps, the most satisfactory case of hour-glass contraction during labor that I have been able to find. It is reported in the *Canada Medical Journal*, 1872, vol. 8, p. 444, by Dr. P. R. Shaver, of Stratford, Ontario. The patient was in her fifth labor, which had been in progress forty-eight hours. Head resting on the perineum; delivered by forceps. After waiting an hour for the placenta, the patient reluctantly permitted the doctor to introduce his hand into the uterus. When this had been done, a second child was discovered, "completely closed in a cavity by itself." The orifice through which the "finger passed to reach the head was about the size of a half-crown in diameter, and the fibres of the ring were as rigid and firm as sole leather." "The case was one of hour-glass contraction in which the uterus was divided into two compartments, one portion for each child." Counsel was asked, and Dr. Frazer sent for, who examined the patient and confirmed the diagnosis. The woman was obstinate, and refused to believe in the presence of a second child, nor would she submit to the treatment proposed—version—until twelve hours had elapsed. Under chloroform, the stricture was passed, the feet secured, and delivery effected. Child dead, and in a state of decomposition.

"There were two placenta—one in the lower segment and the other in the upper chamber. I introduced my hand and found the lower one detached, but the upper one was adherent, and required great care and patience in peeling it off." The mother died eight hours after delivery. No post-mortem examination was allowed.

Being apprehensive that I might do injustice to Dr. Shaver by quoting his case, and interpreting his language to mean that a *child and its placenta* had their habitat in each of the compartments—for doubt existed as to the seat of the placenta of

the first child—I addressed a note to Dr. S., and received a prompt answer, dated January 19th, 1882, as follows:

“The first child and its placenta were situated in the lower segment, and I remember feeling the first placenta when I introduced my hand to pass it through the stricture to procure the second child. There were two distinct chambers; each one contained a child and its placenta.”

This case is too pointed to admit of discussion.

The next two cases are reported by Dr. T. A. Reamy, in the *Transactions of the Amer. Med. Association*, 1878, vol. 29, p. 411.

CASE V.—Seen in consultation by Dr. Reamy, in March, 1878. The patient had had two difficult labors before, and the children were still-born. There was diminished conjugate diameter of the pelvis. The os was well dilated. Forceps had been tried without effect. Chloroform was administered and the forceps tried again; but no advance was secured. Child still alive, and parents anxious that it should be saved. Version was determined upon. “The os and that portion of the uterus which had corresponded to the cervix were found to be in a state of complete relaxation; and, although contractions and relaxations of the uterine fundus were proceeding with fair force, the lower uterine segment was in no way concerned.” Attention was now called to a “remarkable constriction in the abdominal wall at a point immediately below the umbilicus. The gutter, which was deep, was found to correspond to one in the uterus.” This was encountered by the right hand, and “it seemed pretty certain that the band of constriction did not pursue a direction corresponding with the os internum, or horizontal to the long axis of the uterus, but obliquely from before, upward, and backward, and slightly to the right of the mother.” After prolonged use of chloroform, the stricture yielded sufficiently to permit version to be accomplished, but delay in delivering the head, owing to the deformity in the pelvis, caused the death of the child. The mother recovered.

This experienced observer, whose reputation is national, was not likely to have been misled by the condition of the parts. His great knowledge of the obstetric art fully qualified him to say whether the obstruction which he felt was a rigid os internum or an unusual contraction of uterine tissue above that point.

CASE VI.—Communicated to Dr. Reamy by Dr. Edwards, of Xenia, Ohio. This patient was in her eighth labor, all the previous ones having been easy. Patient was impressed with the idea that she would not get through this confinement. In about forty

minutes she was delivered of a boy weighing five and one-half pounds. Twenty minutes later, a second boy, weighing five pounds, was born. A third was now found presenting. "The head had nearly escaped from the soft and yielding cervix." Two fingers "straddling" the neck enabled the physician to exert a good deal of force, but he "found no good results from traction." Hour-glass contraction was felt through the abdominal wall. The patient becoming exhausted, morphia and brandy were administered. Under chloroform, the hand was introduced, and securing a good purchase, a dead female child, weighing four and three-quarter pounds, was delivered. Hour-glass contraction retained the placenta (for there was but one), which was removed with great difficulty, and the mother died.

CASE VII.—This case somewhat resembles that of Dr. Shaver. There were twins, the second one being retained in the upper chamber of the uterus. The labor occurred at the sixth month, that is, according to the old theory which Bandl attempts to revive, before the cervix begins to enter upon the duty of adding to the capacity of the cavity of the uterus, and before the time when the "new cervix" has a being! It is to be found recorded in the *Phil. Med. and Surg. Rep.*, 1876, vol. 34. The name of the reporter I have mislaid.

CASE VIII.—Reported by Dr. N. McGarvin, of Acton, C. W., in the *Montreal Medical Chronicle*, 1859, vol. 6.

Patient advanced seven and a half months. Pains regular. Os well dilated, but could detect no fetus. Waited some time. In an hour and a half, the membranes broke, and about one and a half gallons of water escaped. Still the fetus could not be felt. The hand was introduced into the uterus, and found the cord which entered a small aperture. Passing the finger through this, the fetus was felt. The stricture was dilated by the hand, and the feet secured and brought down, thus effecting delivery. The doctor adds: "The cavity below the stricture was quite large enough to contain a full-grown fetus." The child was saved, and the mother recovered.

CASE IX.—Occurred in the practice of Dr. D. L. Crist, Bloomington, Ill. (*Chic. Med. Journ.*, 1866, vol. iii.). This patient was in her seventh labor. An unusual quantity of liquor amnii was discharged. A breech-presentation was recognized. The case was left to nature about an hour, "pains continuing regular and powerful." About this time, it would appear from the relation of the case (for the language is ambiguous), spontaneous version must have taken place, for it is next stated that at each succeeding pain, the head came down into the true pelvis, but immediately retracted above the superior strait as soon as the pain ceased." Passing the hand into the uterus, the body of the child was found to be firmly grasped by a constriction in the uterine walls. The feet were finally brought down, and a dead child delivered. The mother recovered.

CASE X.—Dr. J. R. Moore, New London, Wis. (*Chic. Med. Journ. and Ex.*, vol. xl., p. 253). Fourth labor. Water broke early and was excessive in quantity. The os was well dilated, soft and flabby. The head presented, and seemed determined to force its way into the right iliac fossa. The abdominal walls were “flabby, owing to the loss of tonicity from large abundance of water” discharged. Uterine contractions were powerful. The head could be dislodged, but at once returned to its former position. After long delay and consultation, version was accomplished, and the child and mother saved. The obstacle to delivery was not found until after the hand passed the head. “But here I found as great a constriction as is possible to find in hour-glass contraction after delivery of the child.”

“Below the constriction there seemed to be but little muscular contraction, but at and above, it was indeed powerful.”

CASE XI.—Dr. Angus Macdonald reports the following case in the Transactions of the Edinburgh Obst. Soc’y, 1878–9, vol. 5, part 2, p. 54.

The patient, who was in her fifth labor, was attended by a pupil of Dr. Macdonald’s. The presentation could not be made out, although the labor pains were severe and the os half dilated, with the bag of membranes protruding through it. Dr. Macdonald’s presence was, therefore, requested, and an examination “led to very peculiar results. Immediately above the cervical segment, which was half dilated and easily dilatable, the lower uterine segment was felt to project or bulge in a peculiarly rigid or shelving manner from before backwards, so as to close in the anterior half of the pelvic inlet. Posteriorly a similar condition of the lower uterine segment existed. The rigidity of the parts was so great,” that the presentation could not be made out. Repeated attempts to determine this point caused the perineal and levator ani muscles, “as well as the lower uterine segment,” to be “thrown into a condition of intense spasm.” The patient was deeply chloroformed, by which means the spasm was suspended, and the head found to be presenting. The membranes were now ruptured, and interference delayed “in the expectation that a pain or two would expel the head.” As this did not occur, an examination revealed the fact “that the contraction of the lower segment of the uterus was such that the outer os and cervical cavity were flaccid during a pain, whilst the inner os was closely shut by the rigid belt of uterine fibres powerfully contracted above it. Another delay and no progress, and the patient was again chloroformed deeply, when the doctor experienced but little difficulty in turning and safely delivering the child. The patient was an epileptic.

Macdonald’s case is of special importance, for the reason that the doctor had paid particular attention to the condition of the cervix uteri and its changes during the latter months of gestation. His reference, therefore, to the “lower uterine

segment," carries with it the force of authority which would not be accorded it if coming from a novice in the profession.

The above cases, it seems to me, ought to be sufficient to convince any one that the claim which throws upon the cervix the burden of obstructing labor, by stretching, elongating, and finally rigidly contracting on the uterine contents, is not only not to be admitted, but to be considered as entirely refuted. It is necessary, however, to introduce the cases upon which Dr. Hosmer bases his theory, in order to show that there is no difference between them and those which I have already related. Only one of the cases came under Dr. Hosmer's personal observation, the remainder having been communicated by physicians who had read his article in which his case had been incorporated.

CASE XII.—Seen by Dr. Hosmer in consultation with Dr. L. R. Stone, of Newton, Mass. (*Boston Medical and Surgical Journal*, 1878, vol. 98, p. 360).

The patient was a primipara, æt. 30. Had been in labor seventy hours. Her general condition was fair, but the pains had diminished in strength and frequency. The promontory of the sacrum encroached seriously on the conjugate diameter of the superior strait. The occiput was to the right acetabulum. Os well dilated and out of the way. Forceps had been tried, and failed, but Dr. H. again tried the same means with a like result. Version was then attempted. The left foot was seized and brought down, but no force could change the position of the child. Tape was passed around the limb and traction made until the tissues began to yield. Then the head was opened and emptied, and forceps applied, but without the least progress being made. Attempting to bring down the right foot "midway between the os and fundus, in the uterine cavity," a "powerful constriction, grasping and holding the pelvis of the child like a gigantic sphincter," was found. The foot was ultimately reached and brought to the brim of the pelvis, and a tape fastened thereto. By the persistent exertion of unusual force, turning was accomplished, and a six or seven pounds child delivered. The placenta was removed without trouble. The patient died seventy-two hours afterwards.

CASE XIII.—Communicated by Dr. G. J. Arnold, Roxbury, Mass. Patient a primipara, æt. 28. Had been in labor forty hours. Forceps, on being applied, slipped without changing the position of the head. Turning was decided upon, and the hand reached what was supposed to be the fundus, but a careful examination discovered a constriction about the upper third of the uterus, encircling the child and inclosing its hips and lower extremities. "It seemed like an hour-glass contraction of a large,

firm band, with its inner edge quite sharp." The attempt to reach the feet met with great obstacles, and the hand of the operator "was paralyzed and almost useless." "After prolonged efforts, one foot being secured at a time, version was effected, and the labor completed with no more difficulty than might be expected in a primipara with an imperfect pelvis." The child was born alive and did well. It weighed nine and a half pounds.

In the second labor, the same difficulty was encountered, but again the patient was safely delivered of a living child weighing ten and a half pounds.

The same condition of things existed in the third labor, and mother and child were both lost.

CASE XIV.—Dr. C. A. Thompson, Jefferson City, Mo. This patient was twenty-two years old. Her previous health had been good. The pelvis was ample. After labor had continued thirty-six hours, the cause of delay was "found to be a constriction encroaching upon the uterine cavity," "situated about one-third way from the os to the fundus." "Delivery was accomplished with a blunt hook, after craniotomy, forceps, and a thorough trial at version had failed."

Eighteen months later, the patient was again taken in labor, and the same trouble having arisen, she died undelivered.

CASE XV.—Seen, in consultation, by Dr. F. D. Adams, of Waltham, Mass. The patient was a primipara, thirty years of age. Had been in labor twelve hours. Pains being ineffectual; forty grains of quinine were given, as an oxytocic, with marked effect. When seen by Dr. Adams, the os was well dilated, the occiput to the left acetabulum, and high up. Forceps had been applied, while the patient was under the influence of ether, by the two physicians previously in attendance, without effect. Version was, therefore, determined on. On passing "the hand beyond the brim of the pelvis, the neck of the child was found grasped firmly by a sharply defined, circular constriction of the uterus, beyond which the hand could only be passed by the greatest and most persevering effort." One foot was brought down, "and, eventually, after repeated attempts, the other foot was secured; but no amount of traction, assisted by external pressure over the head, overcame, in the least, the resistance of this constricting band of uterine muscle. Under the impression that this resistance, which seemed to be entirely muscular, would certainly yield to continued traction, an amount of force was used which under other circumstances would be unwarrantable, and was continued until the tissues of the child began to give way. The attempt was now made to perforate, but the apparent relaxation of the uterus, which had come on suddenly, and the collapse of the patient, warned us to desist and to withdraw the ether." The patient did not rally, sank rapidly and died undelivered.

"At the autopsy, made a few hours after death, the child, a large one, was found lying in the abdominal cavity, having escaped from a bruised laceration of the uterus occurring at the

point where pressure had been made upon the head in the attempt at version."

CASE XVI.—Doctor Hosmer states a case of Bandl's, as follows: "The os internum was as high as the umbilicus; the cervix was as thin as paper and so enormously stretched that it covered more than half the fetus. The presentation was by the face. Forceps failed, and after craniotomy a child was extracted which weighed a little more than eight pounds. On the fourteenth day the woman left the hospital well."

The next two cases are reported by physicians who, having read the papers of Hosmer, agree with him in locating the seat of obstruction at the internal os uteri.

CASE XVII.—Dr. W. A. Briggs (*Pacific Medical and Surgical Journal*, 1879, vol. 21, p. 337).

This patient had had four normal deliveries. She had been in labor three days when Dr. B. was called in. On examination the os was found dilated, the presentation being of the right shoulder. The hand came in contact with the constriction which encircled the neck of the child, and the finger passed "through an opening in the presumed uterine roof." The "cord" grasped the neck of the child and the finger of the physician, who adds, "and almost cuts them, such are its wonderful power and tenuity. My finger is withdrawn in pain." Turning was finally accomplished and the labor terminated. The child was dead, but the mother recovered.

CASE XVIII.—Dr. L. R. Stone, Newton, Mass., records this case in the *Boston Medical and Surgical Journal*, 1880, vol. 102, p. 517. Primipara. Labor tedious. Os well dilated. Cervix long. Forceps applied "through the cervix." Unavailing strong traction made. Forceps slipped off entirely. On "further examination, the finger felt the firmly constricted inner os hard, rigid, and unyielding, traceable in its entire circumference about the child's neck, but the shoulders could not be reached." Some hours later, forceps was again tried, "and the patient, with a good deal of labor," delivered of a dead child. The mother recovered.

Comment on the foregoing cases will be reserved.

The next three cases, from the practice of Prof. George T. Elliot (Obst. Clinic, chap. vii.), show that the management of this class of cases has been no more successful in the skilful hands of this able obstetrician, than those occurring in the practice of physicians of less experience and reputation.

CASE XIX.—Seen by Prof. Elliot in consultation. Fourth labor. Waters had been discharged more than twelve hours. Brow presented; os fully dilated. Forceps had been tried but

failed. "No advance had been made through the brim, nor was there any arrest by any part of the pelvic brim; on the contrary, flexion could be readily brought about, and the presentation converted into that of the vertex." Forceps applied by Dr. E., but the strongest traction only reproduced the brow presentation. Proceeding to turn, he found the arrest was due to a circular band, tetanically contracted a little below the shoulders of the child. He "toiled vainly" to bring down the lower extremities, and then Dr. Bishop renewed his efforts and brought "the left foot to the brim of the pelvis, from which place we could advance it no further nor push up the head." The child being dead, the head was opened and the instruments "broke away piece after piece of the well-ossified head without advance." The cephalo-tribe was then applied and the head crushed through one diameter. Traction still failing, the instrument was again applied, and the delivery finally accomplished. The placenta was retained by imperfect hour-glass contraction, but removed without trouble. The woman recovered.

CASE XX.—Seen in consultation. Second labor. There had been some difficulty in the first. The membranes had ruptured. Brow and face presentation. The position was corrected by one blade of the forceps, but resumed on withdrawal of the instrument. Head not engaged in the brim. "Further up there existed a band of circular uterine fibres, unduly and tonically contracted, the contraction not bearing any relation to the degree of contraction in the other uterine fibres." Traction with forceps failing, the feet were brought down, but discovering that the child was dead, the skull was perforated, and the child withdrawn by the aid of Churchill's crotchet. No trouble with the placenta. The mother did well.

CASE XXI.—In consultation. Primipara. Seen by Dr. Elliot at 11 A.M. Membranes had given way fourteen hours after labor began. At 9 P.M., "the head had escaped pretty well through the cervix uteri," but "above the head a band of tonically contracted circular fibres prevented the advance of the child." The brim of the pelvis was contracted to three and three-quarters inches in its conjugate diameter. The case occurred in the hospital, and "members of the house staff were invited to feel the circular contraction of the uterus, and distinctly recognized it." Forceps failed. "Version was rendered impossible by the condition of the uterus." The general condition of the patient being good, "parts moist and of good temperature," "Dr. E. decided to wait three hours," at which time (twenty-eight hours after labor commenced) the patient was exhausted, restless, and irritable. Parts hot and dry. Pulse, 100. Fetal heart scarcely audible. Thorough trial with forceps again failed. Craniotomy was then performed, and delivery effected with some difficulty. The patient made a slow recovery.

Dr. Elliot expresses his deep regret at having to sacrifice a living child.

No good was accomplished by the delay in the last case. The tonicity of the contraction was not, in the least, overcome, while the mother's strength was wasted in the futile efforts of nature to extrude the child.

The following case is unique from the complication with a fibroid, and the ingenious manner in which delivery was accomplished.

CASE XXII.—Reported by Dr. A. C. Fosdick, Liberty, Ind. (*Cin. Obst. Gaz.*, vol. iii., p. 121).

Multipara. "Waters had been draining for ten days with occasional pains." Examination revealed "a smooth, tolerably solid, round substance, three inches in diameter," which filled "the vagina and pressed the perineum." The hand was passed into the vagina and found the os dilated. Carrying the "hand along a funnel above the brim of the pelvis," it "reached a ring two inches in diameter," above which he found the "presenting head of the child, to which was appended a fibroid of about three pounds weight." Gave ipecac in doses of fifteen grains, and when the patient "called for a basin," pushed the hand through the ring and delivered by turning. The child had been dead some time. The mother recovered.

The next is the only case of breech presentation I find recorded.

CASE XXIII.—By Dr. E. Mason, Wetumpka, Ala. (*Atlanta Med. and Surg. Jour.*, 1875, vol. xiii., p. 389).

The patient was a primipara. Labor tedious. Breech presentation recognized. The membranes were ruptured before Dr. M. arrived. The os was slightly dilated, and "soft and dilatable, but quite thick." The pains were peculiar. "During the first part there would be slight downward pressure, then sudden spasmodic pressure upwards." After waiting a long time, "attention was directed to the appearance of the patient's abdomen, which had caused her lady friends to predict that she would have twins. The uterus slightly represented two tumors, one above and the other below, which peculiarity could be recognized by careful examination with the hand." Futile attempts were made with the blunt hook and hands to bring down the breech. The hand was then passed into the uterus until it was "even with the umbilicus of the patient," and "found the body of the child embraced by a band-like contraction, which became hard and tense during pain." On again applying the blunt hook over the groin of the child, and making traction, delivery ensued. The placenta was found attached to the right side, "just above the contraction." The child was still-born. Mother recovered.

From the recital of the last case, it would appear that the constriction was present during gestation, so as to have called out the remarks of the laity from the appearances produced. It can hardly be claimed that the os internum actually reached the umbilicus of the mother before labor commenced!

The peculiar character of pains, referred to above, is also alluded to in the next two cases to be mentioned. This symptom was noticed in a great many of the cases, but has been omitted in the report of most of them so as to avoid needless repetition.

CASE XXIV.—Dr. Wm. Johnson, White House, N. J. (*Phila. Med. and Surg. Rep.*, vol. i., p. 285). The patient was in her fifth labor. Former labors had been easy. Had been in pain all day. Os dilated to the size of the palm of the hand, but tumid, though soft and yielding. Vertex presentation. The liquor amnii had escaped two hours before the physician arrived. Pains were recurring every five minutes. Expulsive pains continued for four hours with no sensible advance of the child. The patient complained that the pains were unlike any she had ever before experienced. Instead of terminating in the thighs, they “shot upwards towards the fundus uteri.” The obstruction could not be reached until the hand had been introduced, when “a firm band of muscular fibres” was found tightly embracing the child’s neck. The high position of the head influenced the physician to try the dilating power of the hand on the stricture, instead of resorting to forceps. In this he was successful, after twenty minutes, and, by turning, delivered an asphyxiated child which could not be resuscitated.

CASE XXV.—Dr. H. G. Davis (*Phila. Med. and Surg. Rep.*, vol. xiv., p. 484). Patient thirty-eight years old, in her sixth confinement. Vertex presentation. Os well dilated; pains regular and good. After waiting three hours, and no progress being made, a thorough examination was instituted. The vagina was large and soft, and everything seemed to favor a speedy delivery. The liquor amnii had escaped. After waiting six hours, ergot was given which produced violent pain in the umbilical region; it was then discontinued. The patient and her friends refused permission to use forceps, “all believing she must die.” The hand being introduced, met with no obstruction until it “came to about the centre of the womb.” Here a constriction was found, “as if a strong rope had been tightly drawn around it, embracing the child near the umbilicus.” The hand was passed, with difficulty, through the constriction and held there until the band yielded, and a living child was expelled in a few minutes. The mother did well, and in a subsequent labor had no return of the trouble.

In none of the preceding cases has the size of the child seemed to enter as an obstructing element. In fact, nearly all the children were small. The following is an instance where the child was very large.

CASE XXVI.—Dr. G. M. Noble reports the following (*Phila. Med. and Surg. Rep.*, vol. xxxi., p. 121).

The patient had been in labor fourteen hours. The os was high up, and the examination unsatisfactory. At noon the os was dilated to three inches in diameter, the vertex presenting. Membranes ruptured one hour later, but the head did not descend. At 4 p.m., the head descended low enough to allow the forceps to be applied, but, although the head could be moved, delivery was not accomplished. "Thinking the head was too large to be delivered entire," craniotomy was performed, and still he could not deliver. Introducing the hand, he found the uterus was contracted around the neck of the child, as in post-partum hour-glass contraction. Failing to relax the stricture, he succeeded in getting a firm hold on the bones of the cranium and chin, and managed to deliver the head. The body followed after considerable force had been applied. Dr. N. adds that the child was much the largest he ever saw.

The occurrence of premature labor has been referred to in connection with a case of twins. The notes of the case of Dr. A. H. Goelet, of New York (*N. Car. Med. Journ.*, 1878), may here be recorded.

CASE XXVII.—Labor occurred at six and a half months. The os was fully dilated and the membranes intact, but no presenting part could be detected. Pains were feeble, and ergot was given to excite uterine action. When this occurred, the membranes were ruptured, and gave vent to a large quantity of water. The hand was then passed in, and found the uterus "contracted in the centre," the fetus above the constriction, and a finger protruding. Dilatation was gradually effected, and delivery accomplished with much difficulty.

Death and decomposition of the fetus was met with in the following case:

CASE XXVIII.—Reported by Dr. L. P. Stiles, Leavenworth, Kan. (*Leavenworth Med. Her.*, 1871-2, vol. v., p. 1).

The patient was in her fifth labor. The head was born. Contractions were strong, but no advance was secured. The child was dead and decomposing. On making firm traction by the fetal head, it separated from the neck. An arm was brought down, which also gave way. Hour-glass contraction was found, but delivery was finally effected. The woman made a rapid recovery.

CASE XXIX.—Dr. Wm. H. Church, Surgeon to Bellevue Hospital (*Amer. Med. Times*, N. Y., 1861), was called at 1 A.M. to a patient in her fourth labor. She progressed favorably until 8 A.M., after which no progress was made. At 10 o'clock, she was seized with convulsions. The membranes ruptured, and the os dilated to the size of a silver dollar. Assistance was sent for, and forceps applied, but the head "could not be advanced in the slightest degree." Chloroform was administered and the head perforated, after which the hand was passed into the uterus, and "a firm contraction of the muscular fibres of that organ about the neck of the child was discovered—thus retaining the body and extremities in the upper part of the womb." "After two hours' hard work," turning was effected, and the child delivered, but the woman died in an hour.

CASE XXX.—Under the care of Dr. Skae (*Monthly Journ. Med. Sciences*, 1850, vol. 10, p. 391).

The os began to dilate forty-eight hours after pains commenced, and labor progressed favorably as far as dilatation of the os was concerned; but it was a long time before the presentation could be made out. Labor pains became severe, but with little change in the position of the fetal head. "The head descended, during the pains, to the brim of the pelvis, but never entered it." The pelvis was large and well-formed. Prof. J. Y. Simpson was sent for, chloroform was administered, and the obstruction "found to depend on the presence of a rigid stricture, situated in the lower third of the uterus, upon which rested the shoulders of the fetus. After administering one hundred and twenty drops of sol. mur. morphia, and keeping her pretty deeply under the influence of chloroform for two hours, it was found that no material relaxation of the stricture had taken place, to admit of turning, without endangering the integrity of the uterine walls." Prof. Simpson succeeded in applying the long forceps and accomplishing delivery in fifteen or twenty minutes, "by dragging the shoulders of the fetus through the stricture." Both mother and child did well.

Dr. Skae believes the obstruction to have been in the nature of a permanent stricture developed during pregnancy.

A few other cases have been referred to, but not having had access to the volumes in which they were recorded, I am unable to say more about them. It will be observed that all the cases noted above have occurred in this country and Great Britain, with the single exception of Bandl's.

Cases which admitted of doubt have not been included in the list. I refer to cases like that of Lusk (*AM. JOURNAL OF OBST.*, 1878, vol. vii., p. 595) and Davis (*Phil. Med. and Surg. Rep.*, vol. xxx., p. 115), which look more like examples

of rigidity of the os than they do like hour-glass contractions. Those in which the diagnosis was made from abdominal palpation and evidence deduced therefrom have also been left out, as it was my purpose to introduce only such cases as were demonstrated by the introduction of the hand, although hour-glass contraction was found to exist post-partum. Reamy's third case, and that of Johnston (*Phil. Med. and Surg. Rep.*, vol. xxxiv., p. 61), belong in this category.

Great injustice would be done the profession, if, after this long recital of cases, no effort should be made to utilize the facts observed and the lessons to be derived therefrom.

The appalling mortality is first to be noted. In thirty-three labors of thirty women, eight mothers and twenty-five children were lost. Three of the mothers died undelivered. As far as stated in the report of the cases, only seven were primiparæ. In one case, the mother had gone through thirteen confinements. Of the women who died, four were primiparæ.

Treatment was of a mixed nature. Forceps signally failed. By turning, seven children were saved, while only one living child was delivered by forceps. The craniotomy record is sickening, the operation having been resorted to in ten cases, although in most of them forceps and turning had been tried unsuccessfully. Bleeding was resorted to in the case of Dr. Baltzell, that being orthodox treatment at the time it was tried. Opium did not seem to be of any special value. Chloroform so generally failed to relax the stricture that it may be said of it: "Tried, and found wanting." Nauseants were tried but once, and with such a good result that I think the example of Dr. Fosdick should be followed in other cases before severe operative procedures are resorted to.

It will be seen that the treatment pursued was manifestly unequal to the emergency. And yet what other course could have been followed which held out a promise of better results? The character and professional standing of many of the physicians in attendance on these cases is ample guaranty that nothing was done without careful consideration of all the circumstances calculated to effect the best results. Where delay was advised and permitted, nothing beneficial was accomplished for the mother and child. The obstacle was not disposed to yield when let alone, and when interfered with

proved an almost insurmountable difficulty. Even when early recognized, no treatment which was followed seemed to meet the case. Are we to look upon the Cesarean operation as holding out encouragement in future cases? Hosmer and Harris are disposed to think that way, the latter, however, not until turning has been attempted. If the operation is to be looked upon as a justifiable one, it must be resorted to without any such attempt being made, if the object be to save the child. This declaration is based upon the fact that, in many of the cases reported, the death of the child occurred early in the labor. The question of diagnosis is, necessarily, involved in this operative procedure. In very few cases was the nature of the obstruction recognized before labor had been found to be obstructed from some cause, and even when rendered probable by external examination of the abdomen, it was rather by accident than design that a constriction was discovered through the ventral parietes. Then, if a constriction should be discovered by external examination, in a case where labor is delayed without the cause being apparent, would a surgeon be justified in proceeding to perform laparo-hysterotomy? I think not. In my opinion, nothing short of the recognition of the stricture by the hand passed into the uterus would justify the resort to operative measures of that character. The most general symptom present in these cases is early discharge of liquor amnii, which, in many cases, is excessive in quantity. Next comes the dilated and flaccid, not attenuated, condition of the lower uterine segment; for this symptom was present when the hand placed over the fundus and the expressions of the mother indicated that the uterus was laboring to expel its contents. The peculiar and ineffectual pain complained of by many patients, and already alluded to above, also appears as a characteristic symptom of great importance. I may be pardoned if I digress at this point to say, that a consideration of the subject of this paper, as exemplified by the cases narrated, will probably induce physicians to avail themselves of the opportunities offered of making external examinations of the abdomen in women in labor more frequently than has heretofore been done. A great deal of information may be gained in this way, as has been pointed out by Mundé in his work on "The Diagnosis and Treatment of Obstetric Cases by External

(abdominal) Examination and Manipulation," and the chapter on a kindred subject in his "Minor Surgical Gynecology." The question then recurs, Are there any special dangers from the Cesarean operation in these cases which are not met with in the performance thereof under ordinary circumstances? The answer will depend upon the explanation as to the seat of the stricture. If it be in the uterine tissue itself, the answer would be, no. If the physician is satisfied that the internal os is the obstructing cause, he will have to violate the surgical rule, which requires avoidance of the cervical region in operating on the uterus, as in performing the Cesarean section. To divide the uterus at its internal os would most certainly add greatly to the risk to be incurred by the mother.

With the evidence in our possession, it seems to me that we cannot look with favor on the operation of laparo-hysterotomy in this class of cases. Usually the labor has been in progress many hours before the obstruction is discovered. The waters have been discharged, and the constriction encircling the child has probably affected it so injuriously as to have rendered it probable that life cannot be preserved, even if it be in a living state when rescued. Attention is directed to the condition of the child delivered by Dr. Edwards for evidence of the effect of the stricture. Every physician will act on his own judgment until the results of the investigations into the cause of the dystocia in future cases may justify the formulation of rules whereby *prevention* may secure immunity from this dangerous obstruction. The only probable cause which has been considered to bring about this form of difficulty in labor, as far as my information extends, is early escape of the waters, whereby irregular contraction of the uterus may be induced. It is true that some have looked upon contracted pelves as influencing the development of the stricture, but too many cases have been cited in which this cause did not exist to justify us in seriously entertaining it. I believe, however, that pressure against the promontory may act as an exciting cause, irrespective of the question of pelvic deformity.

It will now be proper to return to the question whether the os uteri internum or the muscular tissue of the uterus is to be looked upon as supplying the obstructing material in antepartum hour-glass contraction of the uterus. Premising that

authorities do not agree in their views concerning the anatomy of the musculature of the uterus and its cervix, some maintaining that the cervix is a veritable sphincter, and others disputing the fact of the existence of such an element to the extent claimed, it may be proper to refer briefly to the views entertained on the subject so far as they relate to the subject under consideration.

Savage says: "When moderately injected so as to restore the organ (the uterus) as near as may be to its normal condition, its outer surface is uniform, no sulcus line of demarcation between body and neck, notwithstanding the marked difference in the proportion and arrangement of their uterine elements." And, quoting Frey, who says "around the neck of the womb the fibres are arranged in transverse bundles, so as to form a regular sphincter uteri," he adds "a description most assuredly far from exact." Further on he refers to "The outer longitudinal muscular fibres of the cervix, those which do not form a part of the vaginal attachment, intermixing with transverse fibres." Lusk says (*Midwifery*, p. 16): "A special re-enforcement of the muscular fibres around the internal orifice of the cervix, constituting the so-called 'sphincter,' is admitted by most anatomists." We cannot even argue the question on fixed anatomical facts, because the very ones that are material, and, indeed, essential, are in dispute. Even the subject of post-partum hour-glass contraction is not settled, although it has been under discussion for ages. At this time, no man of standing in the profession is willing to risk his reputation by an unqualified opinion, which fixes at the os internum the *only* spasmodic element in cases of that kind. All have a mental reservation, a doubt, on the subject which only demonstrates their conscientiousness. Goodell and A. H. Smith *doubt* if a typical hour-glass contraction, after labor, ever occurs above the internal os; but the doubt is a saving one.

But it is manifestly improper at this time to enter upon the general subject of hour-glass contraction of the uterus after labor, and, with a single quotation, which goes to elucidate the branch of the question I am now considering, I will ask attention to a more pertinent part of the same.

In the discussion on hour-glass contraction of the uterus

before the Obstetrical Society of Philadelphia, December 4th, 1879 (Transactions, Vol. XIII., p. 397), the views of Goodell and Smith, as given above, were expressed. The remarks of Dr. Parish, made on that occasion, are worthy of thoughtful consideration. He says: "Prof. Hélié, in his '*Récherches sur la Disposition des Fibres Musculaires de l'Utérus*,' has demonstrated the existence of bundles of fibres running obliquely from either side of the body anteriorly and posteriorly to the fundus." "Prof. Hélié states that a spasmodic contraction of these fibres in one-half of the uterus would divide the uterus into two compartments, one of these being that portion of the cavity into which either Fallopian tube opens, *i. e.*, '*the infundibulum*,' and the other compartment being the rest of the uterine cavity. He states that he has twice verified this by most careful digital examination, and, in each case, had to dilate the closely constricted portion to remove the incarcerated placenta."

Continuing, Dr. Parish adds this testimony, which has a direct bearing on the cases which go to make up the bulk of this paper. He says: "I have been informed by Dr. R. G. Curtin that, in a Cesarean section performed by himself, a sulcus, transverse in direction, was seen to come and go in the body of the uterus. This sulcus, on the external surface, was evidently due to contraction of bundles of transverse fibres in the middle of the body, for, after the uterine incision had been closed, there was noticed an irregular gaping of its edges at the time of the formation of the transverse groove. A spasmodic contraction of the fibres that produced this shallow furrow, could have undoubtedly produced a marked '*hour-glass*' contraction of the body of the uterus. There was no abnormal alteration of tissues in the uterus."

The views of Bandl, which I referred to early in this paper as influencing current medical opinion on the anatomy and histology, as well as pathology of the uterus, may now be considered briefly in the light of the facts brought out herein.

It was stated that Bandl claimed the development of a new cervix during the latter months of gestation. He further stated that this cervix was capable of immense expansion, transversely and longitudinally. I also referred to Hosmer's papers, in which he utilizes the statements of Bandl to develop

a theory by which he constitutes the portion of the cervix uteri which corresponds to the internal os the constricting material in cases which have been described as "hour-glass contractions of the uterus during labor."

It was also stated that Bandl's opinions had not only not been confirmed, but had been controverted by many of the most distinguished investigators who had had opportunities to form conclusions from facts coming under their own observation. Müller, for instance, did not accept Bandl's explanations. Macdonald states, in the article already referred to, that at the meeting of the Association of German Natural Philosophers, Bandl, among other things, stated that "this new cervix has a line of separation from the body of the uterus, which is distinctly to be felt, lying chiefly at the inlet of the pelvis. This line of separation corresponds to the second uterine os, as described by many authors, and the latter is only identical with the os internum of Braune's table, identical with the os internum which one feels a hand-breadth above the os externum, when one passes it into the cavity of the uterus to perform version or to separate the placenta." This is Dr. Macdonald's translation. Macdonald, in commenting on these expressions, says: "It is satisfactory to find that these erratic views did not find a single supporter at the meeting, but, on the other hand, met with unqualified opposition from every gynecologist present. It is worthy of notice that Bandl finds the original cervix persistent in his cases, but having taken up the theoretical notion that the tissue of the cervix, as we find it in the latter period of utero-gestation, is too small in quantity to be dilated into the cervical zone of the genital passage, as we find it after the cervix is completely opened up, he feels himself constrained to hypothesize the airy structure, an account of which I have translated for you."

Inasmuch as Bandl's papers have only reached the great mass of medical practitioners through isolated sections appearing as translations in the current literature of the profession, I think the statements made above should induce the profession to "make haste slowly" in accepting his conclusions. Already "Bandl's ring" has been figured in the new literature which has been sent out to the profession (see Lusk), notwithstanding the fact that Macdonald's specimen, presented with his paper,

before the Edinburgh Obstetrical Society, clearly demonstrated the error of the revelation; or, as has been quoted before, this new cervix, which, I suppose, includes the ring, was "conspicuous by its absence."

If the cases so fully quoted prove anything, they prove that it is an error to assume that, in cases like Shaver's, Gay's, Reamy's second case, and others, the obstruction to labor existed at the internal os uteri. To my mind, they demonstrate conclusively that it is to the muscular tissue of the body of the uterus that we must look for an explanation, unless we are willing to believe that the whole uterus has been swallowed up in the cervix, except that portion situated above the entrance of the Fallopian tubes. That hypothesis will require too great a stretch of the imagination to make it tenable. With the exception of Stone's second case and Bandl's, attenuation of the cervix was not noted. In nearly all the cases it is stated that the tissues below the stricture were flabby and did not respond to the contractions felt at the fundus. In one case it is stated that "the cavity below the stricture was quite large enough to contain a full-grown fetus," and that, too, in a labor occurring at seven and a half months.

While disposed to deny, from the evidence adduced, that the internal os is ever the point of obstruction in these cases, it occurs to me that the best decision we can grant to those who have made this claim is the Scotch verdict, "not proven."

So many collateral questions seemed to demand investigation, in studying up a subject of such importance as that which has called out this paper, that I deem it necessary to state this much, in order that those who note omissions of important questions may be assured that they were not overlooked, but only left out to prevent an almost interminable length of the communication.

The conclusions which are fairly to be drawn from the foregoing records may be summarized as follows:

1. A true "hour-glass" contraction of the body of the uterus, tetanoid in character, occurs during labor, and adds greatly to the difficulties and dangers of the parturient act.

2. In some cases this contraction may be felt through the abdominal wall, which fact should induce physicians to resort more frequently to abdominal palpation in labor cases.

3. Clinical facts demonstrate that the segment of the uterus below the stricture is in a relaxed condition, and only in exceptional cases is thinning thereof to be recognized.

4. Owing to the lack of harmony in the opinions of anatomists regarding the structure of the uterus and its cervix, hypotheses, based upon assumed anatomical evidence, and unsupported by clinical observations, are not entitled to the weight of authority at this time. In this category are to be included the theories of Bandl and Hosmer.

5. The treatment of cases belonging to the class referred to in this paper must be determined by the special peculiarities belonging to each, until further observation and experience shall justify the formulation of a rule of general application; but it is proper to state that the performance of the Cesarean operation does not seem to be justified because of the existence of the stricture *per se*, for the reasons already given.

ON THE EXTIRPATION OF THE UTERUS PER VAGINAM,
WITH AN ILLUSTRATIVE CASE.

BY

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IN presenting a brief monograph to the profession upon the extirpation of the uterus by the vaginal method, I shall first give an accurate report of the case which suggested this paper, and then point out some of the lessons which the result, it seems to me, teaches.

Mrs. T., of Irish birth, aged fifty-six, and the mother of several children, placed herself under the care of Dr. C. C. McGovern, of this city, for uterine trouble. He diagnosed cancer of the body of the uterus, and requested me to operate; leaving me entire freedom as to any method I might select. Upon careful examination, it seemed certain that the cancerous infiltration was

limited to the uterus, and had not invaded the rectum, bladder, or ligaments. The uterus, however, was so entirely involved that any operation short of its entire removal could only be looked upon as palliative, and even in that sense of doubtful utility. I therefore determined upon its total extirpation, and the method only remained a matter for consideration. A careful study of most of the reported cases of the removal of this organ for cancer, within the last five years, led me to select the operation through the vagina, both on account of the high rate of mortality attending the abdominal section, and because the mobility of the uterus in my case indicated ease of operation, freedom of neighboring organs from involvement, and consequently the radical removal of all diseased tissue.

After much thought, I determined upon a somewhat new plan of operation, as follows:

The uterus to be seized and firmly held in its normal position, to prevent injury to other parts by dragging them downward or out of place. Then with the platinum knife, heated by galvano-cautery, to carefully cut through the vaginal walls, sweeping around the entire cervix, and pressing the uterus directly away from each organ encroached upon in the circuit. By putting the vaginal wall on the stretch at right angles to the rectum and bladder respectively, and keeping the knife close up to the uterus, I believed those organs ran no danger of being opened. Then with the finger or urethral sound the uterus was to be separated from the bladder anteriorly and the rectum posteriorly, until the peritoneum near the fundus was reached, the organ meanwhile being now dragged strongly toward the vaginal outlet. The peritoneum now to be divided with a scalpel both anteriorly and posteriorly, sufficiently to admit passing a finger over the fundus until it met a gum catheter, carrying a wire, passed through the opposite opening. This wire to be carried around the fundus and attached to the galvano-cautery. Another wire, similarly introduced, was to be carried over the other side of the fundus, brought down to the opposite side of the uterus, and constricted by a common *écraseur*; the object of the double constriction being to insure straight cutting and complete separation of the uterus upon either side. Both wires being firmly constricted, the current to be connected with No. 1, and the Fallopian tubes, round and broad ligament to be slowly divided with a cherry-red heat. The other wire, being now liberated from the *écraseur*, was to be attached to the galvano-cautery and the attachments upon that side of the uterus severed in like manner. From a somewhat extensive experience with the galvano-cautery (my battery being very reliable) little or no bleeding was to be anticipated, but if it occurred it was to be controlled by the long hemostatic forceps, left hanging out of the vagina if necessary. No attempt was to have been made to close the peritoneal wound, and the case treated afterward upon general principles; the operation, of course, being performed by the aid of Sims' speculum, retractors, and position.

Having determined upon the above plan, upon the 26th day of October, 1881, assisted by Drs. J. R. Davidson, E. D. Martineut, and C. C. McGovern, I proceeded to operate. The patient was etherized, and the womb seized and held by Dr. Martineut in such manner as to permit my making the necessary counter-pressure with one hand, while using the cautery knife with the other. No difficulty was experienced in cutting through the vaginal walls posteriorly and laterally, but when I attempted to divide the anterior cul-de-sac, I found that, though freely movable in all other directions, the uterus was firmly adherent to the bladder. I barely divided this portion to the depth of the thickness of the vaginal wall, and then proceeded to separate the womb from its anterior and posterior attachments with my finger. Posteriorly, by dragging the uterus strongly downward, this was accomplished with great facility, and I could feel the fundus of the organ with ease. Anteriorly, I encountered a dense, thick tissue, which I proceeded to separate by tearing with the finger, aided by touches with the scalpel. Proceeding slowly and carefully, I reached a point at which I could feel the rounded fundus in front also. At this point, to reach which I had found it necessary to use both blade and handle of the scalpel freely, my finger suddenly passed into a cavity. I at first thought this to be the peritoneal, but a minute's examination revealed the fact that I had opened an extremely elongated bladder instead. This unexpected calamity at once suspended the operation, as I did not dare to open the peritoneum and complete it as originally intended, and now quite feasible, on account of the certainty of the urine finding its way into the peritoneal cavity with necessarily disastrous results. A short consultation was held, and it was decided to remove as much of the uterus as had been completely separated from its attachments, and await developments. This was done. The platinum wire was pushed well up around the excised portion, heated, and slowly constricted. Rather more than one-third of a large uterus was thus removed. No bleeding at all followed its removal. Both uterine arteries had been divided by the platinum knife previously; one had spurted, but yielded promptly to another touch of the hot knife. There was considerable oozing from the anterior portion of the wound, which had been divided with the scalpel, and to arrest this, absorbent-cotton, moistened with a weak solution of erri subsulph., was applied. This oozing was all the blood lost during the entire operation.

There was little shock. The pulse next day was 110; temperature about 102°. After this, both pulse and temperature slowly subsided to the normal, reaching this point upon the fourth day. Some little abdominal tenderness was met and subdued by stapes and poultices. The vagina and wound were syringed out every four hours with hot carbolized injections of water. Very little discharge followed for several days, but upon the seventh day following the operation, it increased and became offensive. The next day, upon introducing the speculum, a large sloughing body was observed. Seizing this with the dressing forceps, I held it

firmly while I explored with my finger. I found it to be the entire womb, and to my surprise, I found I could easily enucleate it from its attachments on both sides, by sweeping the finger around the organ. Very little force was required; the impression to the finger being that of tearing loose connective tissue. Not knowing to what extent the peritoneum might be involved in the sloughing process, and finding the mass pretty firmly attached above, I determined to snare it as high as was practicable, and remove it by the hot wire. This course was adopted in order to do away with as much dead tissue in the wound as possible, to avoid septicemia, and because I feared there might be a central core in the region of the fundus retaining its vitality and circulation from the anastomoses between the ovarian and uterine arteries, and which might cause troublesome hemorrhage if dealt with in any other way. On the next day, the wire was applied, but, after easily removing all the uterus except the fundus, it was found that the traction had loosened that portion also, and it was seized and brought away. Upon approximating the two pieces, I found that the entire uterus, excepting the portion previously removed, had sloughed out, preserving its size and contour, as perfectly as a dissecting knife could have done. A portion of the posterior wall of the bladder, which was firmly nailed to the uterus by epithelial plugs, and which had been cut through during the first operation, came away also.

A careful exploration now revealed that the peritoneum was nowhere opened or injured; but that a section of about one and a half by two and a half inches of the base of a large and extremely elongated bladder had sloughed away.

After hardening the uterus for a few days in alcohol, I made a careful dissection and examination. The entire uterus was surrounded by an easily demonstrable membrane, resembling the dense sheath of some muscles, and which I believe to be an investing sheath of the uterus proper, and not a product of inflammation, although in this instance thickened by inflammatory processes. The disease was a dense fibrous, almost cartilage-like mass, occupying the larger portion of the uterine walls, and causing an anterior hypertrophy. Imbedded in this hard fibrous tissue were epithelial cells in abundance, which were budding out in all directions. The portion of the bladder-wall, which sloughed, seemed to be the only direction in which this epithelial invasion had passed beyond the uterine limits. The patient had complained of her bladder for some time, and it was undoubtedly prevented from contracting properly, as well as irritated by the uterine adhesions.

From this time the patient made a slow but regular recovery. The granulating surfaces healed, the discharge all ceased, and the cavity occupied by the uterus underwent so great a contraction as almost to become obliterated. The fistula in the bladder, however, was, after a few weeks, followed by the usual phosphatic deposits, accompanied with most distressing vesical tenesmus. This was somewhat alleviated by injections of acetic acid and

water. Benzoic acid *per orem* was also exhibited from time to time, as the patient's digestion permitted. She became so clamorous for relief from the fistula that for this reason I consented to close it sooner than I had intended to have done. I desired to leave it open in order to watch for a recurrence of the cancer at this point, and be able to snip off and cauterize any suspicious nodules that might appear.

On the 9th of January, 1882, having cleansed the cavity thoroughly, and finding no trace of cancerous recurrence, I pared the edges of the fistula (reduced by contraction to about six centimetres in length by two and a half in breadth) and united them by silver sutures. Upon visiting the patient next day, I found that she had removed the catheter, on account of its feeling so "uncomfortable," about twelve hours previously, and that urine was oozing between the stitches freely. Of course, the edges failed to unite, although I left the sutures in the faint hope that they might. As the operation had been very tedious and laborious, I was so vexed at her disobedience that I determined to take the easier method of closing the vagina. The absence of the uterus rendering the formation of pouches or sacs improbable, I thought this course justifiable.

On the 25th of January, after another thorough cleansing and inspection, I closed the vagina just at the level of the lowest part of the fistula. This operation was followed by perfect union, and complete relief of all tenesmus and discomfort.

Whether the cancer may or may not recur in this case is, of course, yet in doubt; but up to this date (Feb. 7th), there are no indications of it.

Let us now examine briefly some of the lessons taught by this instructive case.

I think it demonstrates that the vaginal operation, and especially my modification of it, as originally intended and described, is a feasible one under proper conditions. These are:

- 1st. The disease must be limited to the uterus proper.
- 2d. This organ must be freely movable and capable of being dragged easily downward.
- 3d. Adhesions to the bladder must be especially guarded against, and wounding it avoided by proper precautions.

Given a case with these conditions, and I would regard the removal of the uterus as of no greater risk than ovariectomy.

If the operator will divide the vaginal walls and uterine arteries by the galvano or some other practicable cautery, he will have all hemorrhage under easy control, and may proceed with his operation leisurely and carefully. In this case, there was not enough hemorrhage at any time to obscure the vision.

But I believe my case shows plainly that there may be per-

formed a still more simple and safer operation than to open the peritoneum and sever the broad ligaments by cautery, as I intended to have done. This is a sub-peritoneal dissection, leaving the peritoneum uninjured and intact. No one could have seen the organ slough out so beautifully and entirely as it did in this case, without being convinced that it has its own proper investing sheath; and, consequently, a surrounding zone of diminished or capillary vascularity. That it is possible to enucleate the uterus with very little hemorrhage by cutting through the vagina with a hot knife, and then keeping within the limits of this capillary zone—just as very vascular ovarian tumors have sometimes been enucleated—I am firmly convinced. After getting well up to the fundus, considerable uterine tissue might be left with the almost certainty of its being cast off by sloughing, owing to its peculiar vascular supply. Thus the irritation and danger to the peritoneum from the attempt to peel it too closely off may be in a great measure avoided. The wound made by such an operation could be syringed out and kept perfectly pure. It would also admit of tamponing in case of severe primary or secondary hemorrhage. The liability to hemorrhage would be reduced to a minimum, and would certainly be less than from removing a segment of the uterus. In amputations of the cervix, only branches of the uterine arteries are injured, but in operations which involve the lower third of the body, the arteries themselves are divided, and are the source of the severe hemorrhage. The secondary hemorrhage, when it occurs in such cases, my experience leads me to suspect, comes from the collateral dilatation of ovarian anastomoses. The tendency to secondary hemorrhage from this cause would be very much reduced if the whole organ were removed.

I believe also that if we are satisfied the disease has not involved the peritoneum, and has invaded the bladder, it is justifiable to boldly enter that viscus and remove so much of its base as may be necessary for a radical extirpation. The establishing of a urinary fistula is a small evil in comparison with the certain recurrence which would follow leaving a portion of infiltrated bladder-wall behind. If the uterus be completely removed, the contraction of the cavity is soon so great that the vagina is only a useless cul-de-sac, and may be easily closed, so as to restore the integrity and functions of the urinary reservoir. That is, if sufficient tissue have been taken from the

base of the bladder to render closing its own walls difficult or impracticable. And if opening the bladder be permitted by this operation, every experienced surgeon will at once see how it widens its field of usefulness, by bringing within the range of surgical procedure a large percentage of otherwise hopelessly incurable cases. True, the surgeon occasionally sees his patient in time to diagnose cancer of the cervix or fundus before neighboring parts have become invaded; but far oftener, in my experience, this golden time for operating is past when relief is first sought for. Then, as is often the fact, if the disease have extended chiefly in the direction of the bladder, the case is still within the domain of hopeful surgery.

The sub-peritoneal extirpation of the uterus has not been, so far as I am aware, attempted by any surgeon. A suggestion to that effect was made by Dr. Mundé at a meeting of the New York Obstetrical Society several years since (*AMER. JOURN. OF OBST.*, Jan., 1877, p. 106), but pronounced utterly impracticable by Dr. Noeggerath and others. Dr. Mundé based his question on a case of his, in which, after curetting the cancerous cervix and applying chromic acid, the remainder of the uterus sloughed entirely out of its peritoneal envelope, and the patient temporarily recovered. ("The Treatment of Cancer of the Uterus by the Sharp Curette," *AMER. JOURN. OF OBST.*, Aug., 1873, p. 329.)

Noeggerath himself has operated by a method similar in all respects to that which I proposed to employ, except that after separating the uterus anteriorly and posteriorly and opening the peritoneum, he attempted to crush through the broad ligaments with a wire-écraseur, instead of the galvano-cautery. His patient died of shock—a result which is certainly to be anticipated whenever any very great amount of tissue is divided in this manner. I regard the division of the ligaments by a properly heated wire as infinitely superior, because it avoids so large a percentage of this dreaded element.

Schröder draws the uterus down, cuts through the vagina, separates the uterus from the bladder and rectum, opens the peritoneum, and inverts the uterus from behind. He then ligates the ligaments and removes the uterus, now lying in the vagina. Like Noeggerath, he finds the separation of uterus and bladder an easy procedure—a fact which proves the absence of cancerous infiltration in this direction in their cases, or they would have to relate quite a different story. It seems that to forcibly

invert the uterus must be conducive both to shock and to the formation of pelvic abscesses subsequently; but with Schröder's method, this course appears unavoidable.

A number of eminent surgeons have performed the vaginal extirpation with slightly individual details, but in the main following Schröder's plan. The prognosis is stated to be good if based upon the impression produced by those who recover, and not upon statistics. Perhaps a closer attention to details and a settled method of operating may in the future eliminate much of the uncertainty in the results now attending this method. That one woman dies without an effort to rally, and another recovers without an untoward symptom, demands a careful analysis of every point connected with the operation.

On the whole, the present drift of opinion seems to be setting away from Freund's method, and in favor of a vaginal extirpation. In the hope that my method of dividing the broad ligaments by galvano-cautery, if we open the peritoneum, may prove an essential step toward success, and also to strongly urge and indorse the sub-peritoneal extirpation as entitled to a prominent place in our surgical *repertoire* for this dreadful disease, I submit this paper to the profession.

ON THE PREVENTION AND TREATMENT OF POST-PARTUM HEMORRHAGE.

BY

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NOTWITHSTANDING the progress of modern obstetric science, the accident which forms the subject of this communication remains one of the most frequent complications of delivery. Hence, the advantage of our once again discussing the prevention and treatment of flooding, and, by the interchange and record of our individual experiences, assist in freeing midwifery practitioners from the ever-present dread of witnessing death from hemorrhage after childbirth.

Under ordinary circumstances and with ordinary care in the management of labor, death from flooding should be an extremely rare accident. Thus, during a tolerably long practice in different countries, and in various climates, and during my connection with a large lying-in hospital, I have met with only three cases of fatal flooding after delivery. Nor probably would any of these cases be generally considered as coming within the ordinary meaning of the term post-partum hemorrhage—one being a death from flooding caused by inversion of the uterus; in another, the same result was occasioned by hemorrhage consequent on rupture of the uterus; and the third was a case of secondary hemorrhage, proving fatal on the eighth day after delivery, and induced by malignant variola.

If we put out of consideration, for the present, cases such as those just alluded to, it will be found that, as a rule, post-partum hemorrhage is a preventible accident. In most instances, its victims are pluriparæ. Thus, of one hundred and sixteen instances of flooding noted in the Dublin Lying-in Hospital, in eighty-three the patients had borne children previously. The reports of the same institution also prove the beneficial results of that attention to the preventive treatment of flooding, the importance of which was first explicitly pointed out by Dr. McClintock. In Dr. Churchill's tables on this subject, collected from all available obstetric statistics in different countries, it was shown that, in a total number of 170,221 cases of labor, post-partum hemorrhage occurred in 1,370 instances; that is, in the proportion of 1 to 124; and, further, that the maternal mortality thus caused was about one in six of these cases. Now, I have collected the four published reports of the Masters of the Rotunda or Dublin Hospital, and find that, in 47,175 deliveries, there were only 206 cases of post-partum hemorrhage, and that only 16 of these proved fatal.

It must be borne in mind, however, that these statistics merely represent the frequency of cases of severe post-partum hemorrhage under the most favorable conditions—that is to say, in women delivered under careful and experienced medical supervision, and in no way show the probability of that accident under less favorable circumstances. The vast majority of women are delivered without any such specially skilled assistance, and, in their cases, should death from hemorrhage or any other accident occur, a reliable statement as to its cause is

as little to be hoped for as any efficient means for its prevention or treatment.

But it requires no statistical statement or lengthened argument to prove so obvious a fact as the importance of anticipating the occurrence of flooding, especially in pluriparous patients, as these are twice as liable to this accident as primiparæ; and of placing such patients on suitable preventive treatment before delivery. The value of a course of some preparation of iron, such as the tincture of the sesquichloride, for this purpose during the last couple of months of pregnancy needs no observation here.

Inertia, or inefficient contraction of the uterus, is the cause of post-partum hemorrhage in sixty-five per cent of such cases; and in twenty-five per cent of them this accident is due to irregular or intermittent uterine action, the uterus alternately contracting and relaxing after delivery. The primary importance of therefore securing efficient contraction is obvious, and has been expressed by none more forcibly than Dr. Blundell, who speaks of this contraction as "Nature's tourniquet against hemorrhage after labor." But, even in cases where there is no failure in the force of this action, hemorrhage may result from its irregularity or misdirected energy. In cases of such irregular or partial uterine action, the os and cervical zone may be securely sealed by firm contraction, whilst the cavity of the uterus may be enormously distended by hemorrhagic effusion. This condition is, however, less common as a cause of hemorrhage than that last referred to; and the so-called hour-glass contraction may be entirely dismissed from consideration in this connection as a theoretical fiction.

Amongst the several circumstances that predispose to the accident that forms the subject of this paper, none is more frequently met with at the present time than the hemorrhagic diathesis or hemophilia. The most serious cases of flooding after labor that I have met with occurred in persons of this diathesis, or suffering from the "bleeder disease."

In London obstetric practice, according to Dr. Playfair, hemorrhage after childbirth is most frequent in the upper ranks of society, and this is due, he says, "to the effects of civilization, and to the mode of life of patients of that class, whose whole surroundings tend to produce a lax habit of body which favors uterine inertia, the principal cause of post-partum hemorrhage."

In Irish midwifery practice, however, I believe that the converse of Dr. Playfair's proposition is the case, as I have found the hemorrhagic diathesis and a consequent tendency to flooding after labor more frequent amongst the poorer than amongst the better classes in Dublin. The difference between Dr. Playfair's experience and the results of my own observation are probably due to the different circumstances of the places in which our obstetric experience has been gained; Dr. Playfair's views being the result of extensive practice in the wealthiest and most healthy, as well as the largest centre of population in the world, whilst mine are founded on clinical observation in a notoriously unhealthy and comparatively poor city. The greater frequency of the hemorrhagic diathesis amongst the humbler, as compared with the better classes in Dublin, is, I think, amply accounted for by the unfavorable dietetic and hygienic circumstances of the former. In the condition of the ill-fed and ill-housed population, who inhabit the poorest and filthiest quarters of the ill-drained, low-lying city of Dublin, we find combined all the causes, predisposing and exciting, of the bleeder diathesis. Amongst the women of this class, semi-starvation on bread and tea is a state of existence by no means uncommonly met with. As a necessary result of this, the blood of such persons is deficient in fibrin and red corpuscles; the retaining vessels are in a pathological state, from defective functional restitution and impaired nutrition, producing thinness of the vascular walls and diminished tonicities, and giving rise to local congestions and hemorrhagic effusions. Under these circumstances, it is evident that, at the time of labor, when the cardiac action is quickened and the force of its impulse is greatest, there will be a tendency on the part of the congested uterine vessels to yield to the strain then put on them, and thus give rise to post-partum hemorrhage.

Another cause of post-partum hemorrhage should be also alluded to as being now more liable to be met with in practice than was formerly the case—namely, laceration of the cervix uteri, generally resulting from the revival of the abuse of the premature application of the long double-curved forceps during the first stage of labor, by which the undilated os uteri is forcibly torn open, and frequently is lacerated in the process.

The connection between the length of the second stage of labor and the occurrence of post-partum hemorrhage has been

demonstrated by the last annual report of the late master of the Dublin Lying-in Hospital, which, although intended to prove the safety of the use of the forceps at the earliest possible moment, yet shows that of thirty-one hemorrhage cases, twenty occurred in cases where the child was delivered within one hour from the beginning of labor.

The state of the circulation is of great importance as affording an early indication of the probable occurrence of hemorrhage and of the need for prophylactic treatment for its prevention. I have never seen the pulse permanently quickened during labor—that is, not subsiding to its normal rate in the intervals between the pains in any case in which post-partum hemorrhage did not follow, unless it was obviated by proper anticipatory treatment.

Amongst the causes of fatal hemorrhage after delivery, inversion of the uterus is one which is occasionally, although rarely, met with. In a memoir on this subject read before the Obstetrical Society, I showed that in 190,883 cases of labor in the hospital with which I was connected, there had been only one instance of flooding caused by inversion of the uterus. In private practice I have seen one fatal case of this kind.

In that case, to which I was called whilst lecturing at the hospital, when I arrived at the patient's house, I found her in a state of complete collapse from hemorrhage. The uterus was inverted and protruding externally, with the placenta still adherent. The history of the case was that the patient, who was only eighteen years of age, had been delivered of her third child after a very easy and quick labor, about an hour before I saw her. The nurse informed me that there had been considerable hemorrhage during the third stage, and, as there was delay in the expulsion of the placenta, she introduced her fingers into the os to ascertain whether it was adherent or not, another woman making firm pressure over the fundus, when suddenly the womb became completely inverted, and was extruded from the vulva. Dr. Tormey was then called in, and by him I was sent for. Stimulants having been administered, we peeled off the placenta, which was morbidly adherent to the fundus, and the profuse, active flooding ceased. I then returned the displaced organ within the vagina, and applying steady pressure to the fundus, with great difficulty slowly forced it through the inverted cervix, until I had the satisfaction of finding the uterus spring back before my hand into the pelvic cavity. Dr. Tormey then also introduced his hand, and found the parts in their natural situation. It is needless to repeat the details of the further treatment, which was that required by the state of collapse in which the patient then was.

Despite all our efforts, however, she sank rapidly and died within an hour's time, from the effect of the hemorrhage she had suffered before the reposition of the uterus.

The complication of labor with uterine fibroids is another occasional cause of post-partum flooding. The following case is a fair example of the instances of this kind which have come under my observation:

I was sent for by Dr. Boyle, of Rathgar, to see a lady some distance from Dublin, and, on my arrival, finding that she had been for a considerable time in the second stage, delivered her with the short forceps. Hemorrhage set in during the third stage; and, the placenta being morbidly adherent, on introducing my hand to remove it, I found a large fibroid tumor growing from the fundus uteri. After the removal of the placenta, the hemorrhage became still more profuse than before, so that the flooding saturated the bed and floor of the room, and having reduced the patient to apparently the last extremity, was at last arrested by the perchloride of iron and firm pressure on the uterus.

Rupture of the uterus, although generally the most fatal, as well as one of the rarest complications of childbirth, may be possibly recovered from as far as the shock of the accident is concerned, and yet may cause death from the accompanying hemorrhage after delivery, and hence must be referred to in connection with the subject of this paper. A table, elsewhere published, which I compiled from the Reports of the Rotunda Hospital, shows that in 61,814 cases of labor, there were 92 instances of rupture of the uterus, of which only 5 occurred in primiparous patients. Of these cases, 86 proved fatal. In my own experience, four cases of rupture of the uterus have occurred, and of these, in only one did the patient recover.

In that case, which I saw in consultation with Dr. Dudley White, of Dublin, rupture of the uterus resulted from arrested delivery in a transverse presentation, and had occurred before any medical assistance was sought. When we arrived, the patient was in a state of collapse, and on delivering her by version, we found a large rent in the anterior wall of the uterus, extending from the cervix up to the fundus. From this laceration, and from every part of the uncontracted uterus, profuse hemorrhage was pouring into the peritoneal cavity as well as externally. As it would have been impossible to inject the perchloride of iron in the ordinary way, in such a case, without sending the injection into the abdominal cavity; and as the woman was obviously dying from the effect of unarrested hemorrhage, as well as from the shock of the

accident, I saturated a sponge with strong liquor ferri perchloridi, and introduced it in my hand into the uterus, applying it freely. The effect was instantaneous, the hemorrhage at once ceasing. It would be out of place to follow the history of this case here further than to add that, notwithstanding the intense collapse and subsequent severe attack of metro-peritonitis, the patient recovered.

With regard to the preventive treatment of flooding, I may here observe that I have learned, by long experience, the value of a suggestion made by my lamented friend and former master, the late Dr. McClintock, by whose death the Dublin School of Midwifery has been recently deprived of its most distinguished teacher. Dr. McClintock's practice, in cases in which there was any reason to anticipate post-partum hemorrhage, was to rupture the membranes (provided the presentation was natural) at as early a stage of labor as was possible, so as to allow the liquor amnii to drain off before the completion of the first stage, and thus secure that gradual and firm contraction of the uterus which is the only safeguard against flooding. At the same time, however, care must be taken that in such cases the second stage be not so long protracted as to exhaust the muscular contractility of the uterus, and thus directly occasion the accident which we seek to prevent. For labor, and especially the second stage, cannot be needlessly cut short by the premature application of instruments, or unduly protracted by timidity or want of skill in the use of the forceps, without, in either case, exposing the patient to an increased risk of post-partum hemorrhage.

With this restriction, a slow labor is always, as far as the liability to flooding is concerned, safer, *ceteris paribus*, than precipitate delivery. One of the most useful preventives of hemorrhage is the subcutaneous injection of a full dose of the fluid extract of ergot, or of ergotine, as soon as the child's head begins to press on the perineum. Dr. Atthill, of Dublin, and Dr. Routh, of London, have found this practice frequently followed by troublesome abscesses, and the last-named authority has ascribed death in one case to this cause. But I may venture to observe that, in an extended experience of the hypodermic use of ergot, or ergotine, as a prophylactic against post-partum hemorrhage, I have found that, provided the preparation employed was fresh and reliable, this expedient was generally most effectual; and in but one instance have I seen any abscess thus produced, and in that case the ergotine was not sufficiently deeply injected into the gluteal muscles.

The most certain and most important of all the preventives of flooding is the steady pressure of the trained obstetric hand above the fundus uteri as the child emerges from the vulva. Nor should this pressure be relaxed for a moment until the completion of the third stage, and the subsequent permanent contraction of the uterus is secured.

My experience of the most important measures employed in the actual treatment of post-partum hemorrhage may be very briefly stated, as we may, I believe, more profitably employ our time in considering the means by which it may be prevented—

—“*Principiis obsta. Sero medicina paratur
Cum mala per longas convaluere moras.*”

The injection of warm water as a means of arresting flooding was tried in a few cases under my observation ; and the results of these thermal injections were not such as would lead me, in dealing with any serious case of post-partum hemorrhage, to depend on this expedient alone for its arrest. But I can well understand its utility in certain cases of great exhaustion from flooding, still unrestrained by other measures, and especially where the application of cold has been previously pushed too far. Even in these cases, warm-water injections should be conjoined with other suitable remedies, such as perchloride of iron, ergotine, or ether, as may be required by the special exigencies of each case.

Unquestionably the first place in the treatment of serious post-partum hemorrhage must be assigned to the use of the perchloride of iron. It is no exaggeration to say that by his introduction of this styptic into British and American midwifery practice Dr. Robert Barnes has probably been vicariously instrumental in saving more human lives than any physician since Jenner's time. The safety of using the perchloride of iron for the arrest of flooding in the manner it is generally employed has been very fully, and very warmly, debated elsewhere. But, apart from prejudice, it would, I believe, be hardly possible for any practical obstetrician to question the general efficiency of this active uterine stimulus, as well as powerful styptic, in the cases under consideration.

During the last eleven years, I have had occasion to inject the solution of perchloride of iron in sixteen cases of grave post-partum hemorrhage. In fifteen of these, the flooding was thus

arrested, and in one instance, and that a very exceptional case, the styptic failed. I need hardly repeat here, however, that a remedy such as the perchloride of iron cannot be, with any safety, indiscriminately employed in all cases, as some practitioners seem to think who at once resort to its use on the least appearance of hemorrhage. In most cases, the desired effect may be attained by safer means, and therefore this treatment should be restricted to those cases in which the imminent danger of death from flooding outways any remote risk of secondary consequences from the measures employed to obviate the immediate danger of death, which it is our primary duty to stave off, if possible.

One death from embolism three days after delivery, following the injection of the perchloride of iron solution, occurred in my practice some years ago. Whether the fatal event in that case was due to the perchloride of iron or not may be fairly questioned. Death from embolism soon after delivery is not confined to cases in which this remedy has been employed. In the *AMERICAN JOURNAL OF OBSTETRICS*, I have recorded three cases of death from embolism after delivery, and in which the perchloride of iron had not been used.

An objection which has been urged against the injection of the liquor ferri perchloridi in the manner usually employed in these cases, namely with the ordinary siphon syringe, is that the injected fluid may be driven through the Fallopian tubes into the abdominal cavity and thus cause fatal peritonitis, or else that it may probably be forced into the patulous uterine sinuses, and, as already stated, may thus occasion embolism. These objections may be met if the styptic be applied by an instrument, such as my irrigator, which is capable of sending a gentle continuous current of any fluid, at any temperature, and for as long a time as may be desired, into either the vagina or the uterine cavity.

In cases of severe flooding, however, the perchloride of iron may be best used without either syringe or irrigator, by a method to which I have already alluded, and which I tested in several cases of post-partum hemorrhage since I first brought it before the British Medical Association, in a paper read at Norwich some years ago. This method of arresting flooding is simply the introduction of a sponge soaked in strong liquor ferri into the uterine cavity, where it is to be held in the accoucheur's

hand, steady pressure being at the same time made from without over the fundus uteri, until a firm contraction is produced by which the hand and sponge are gradually expelled, and the loss of blood is arrested. In this way we conjoin the direct application of this styptic together with the most powerful stimulus that can be used to induce contraction, namely the introduction of the hand into the uterine cavity.

It is needless to add that a remedy such as this is by no means free from subsequent risk, or to be used without grave necessity and due consideration. Having elsewhere recorded my experience of the use of other remedies, such as turpentine, opium, cold, Faradization, tincture of iodine, vinegar, compression of the aorta, etc., that have been recommended in the treatment of post-partum hemorrhage, I shall not again refer to any of these, but shall conclude with a few words concerning the use of transfusion and its substitutes in cases of collapse from flooding after delivery.

Theoretically, transfusion should be the physiological remedy in such cases, and is a measure undoubtedly destined to fill an important place in the medical as well as in the obstetric practice of some future day. But as yet its success is not such as to justify overmuch dependence on this operation as now practised in the cases we are here discussing. The results obtained by the most improved recent scientific methods of transfusion are little, if anything, more favorable than those attained by Dr. Blundell in his experiments on this subject upwards of sixty years ago.

In those sudden emergencies in which transfusion is indicated in midwifery practice, the assistance afforded should, in the words of an ancient writer, Dr. Willoughby, be "not the feigned or surmised thoughts of man's fantasie sitting and meditating in his study, but that which really have been performed in the travailing woman's chamber." In a case of collapse from flooding, the issue of life or death must be determined within a very short time: and unless transfusion can be rendered facile and rapid in its application it will be generally useless.

In these respects, even the best methods of transfusion which are now practised are obviously defective. Thus Dr. Aveling's direct venous, or Mr. Shaffer's immediate arterial transfusion, or Dr. McDonnell's operation with defibrinated blood, either require such exceptional nicety of manipulation, or are so complicated and take so much time, as to render them inapplicable, in

the majority of cases, to those who may suddenly, and under circumstances the most unfavorable for the leisurely performance of any complex operation, meet with a case of collapse from flooding after delivery.

Healthy human blood should be the only fluid used for transfusion, if it be possible to procure it. But in this "little if" lies a very important question. I have more than once seen transfusion stopped by the impossibility of obtaining the required supply. And hence it is a matter of great interest to ascertain what substitute for blood, if any, can be employed in such cases. The recent experiments of Mr. Shaffer and others have confirmed the old views of Blundell as to the injurious effects of the admixture of the blood of other animals on the human red blood-corpuscles, and hence this source of supply must be excluded. Nor, according to Messrs. Dowdeswell and Shaffer's experiments, can we fall back on the injection of milk in such cases. For, in five out of six instances in which this was attempted in animals, the result was rapidly fatal, and on examination after death, the blood-corpuscles were found to be extensively destroyed and a large development of bacteria to have occurred in the blood. Therefore, notwithstanding the exceptional success of one interesting case reported by my friend, Dr. Meldon, it seems incontrovertible that milk or other similar fluids which contain the germ of septic organisms, should not be used for transfusion after post-partum hemorrhage.

Many years ago, Dr. Martin, of Portlaw, suggested the venous injection of a weak saline solution in these cases, and from what I have myself seen, I have no doubt that, where healthy human blood cannot be obtained, the emergency may thus possibly be tided over and life saved by this expedient, by which the emptied vessels may be so refilled as to afford the heart some mechanical resistance to its rapid contractions and bring back the pulse to an approach to its normal volume, and at least give time for the use of other remedies. I am, of course, aware of the physiological objections which are advanced against this substitute for transfusion, by those who say, that in cases of collapse from hemorrhage, "it is the deficiency in quality, the deficiency in number of the red corpuscles, that is the cause of the dyspnea, etc." "The system is suffering," they add, "from deficiency of hemoglobuline, and it is useless to supply it with any fluid that does not contain this." Such reasoning may be

scientifically accurate, but the practical conclusion is at variance with clinical observation; and where theory and experience clash in midwifery practice, there can, I think, be no question as to which should be followed.

In the hypodermic injection of sulphuric ether, as suggested by Professor von Hecker, of Munich, we have an excellent, easily applied, and generally reliable substitute for transfusion in the treatment of collapse from flooding after labor. Therefore, for some years past, I have always carried with me to every midwifery case a syringe which I have had specially constructed for the purpose, and which differs from the ordinary hypodermic syringe, in holding upwards of a drachm of ether, as less is useless in these cases, and which is not cemented by any gum that might be dissolved by this solvent and thus give way as the common subcutaneous syringe may do. During the past three years, I have resorted to this expedient in several instances of depletion from severe flooding after delivery and believe that it would be impossible to speak too highly of its value in rallying the flagging vital powers, even in cases apparently hopeless, in more than one of which I have seen life thus saved.

A CASE OF COMPLETE INTESTINAL OCCLUSION BY PRESSURE OF AN OVARIAN TUMOR—OVARIOTOMY—DEATH.

BY

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Nyack, New York.

ON July 27th, 1881, I was called to see Mrs. K., aged twenty-seven; mother of twins, born in January, 1879. She had been ailing for several months, complaining of swelling of the abdomen, constipation, nausea, etc. She had been attended by a homeopathic physician previous to my being called, and a diagnosis of pregnancy had been made, which, however, proved to be erroneous. She informed me that she had not had a movement from her bowels three weeks (?). There was enormous tympanitic distention of the abdomen and constant nausea, the stomach rejecting almost everything taken; and she was in a very feeble condition from want of nourishment. Upon further examination, there was flatness on percussion, which extended upwards two inches above the pubic bone, and a tumor could be

felt extending upward in the right iliac region, two or three inches above the line of dulness. Per vaginam, the uterus was found to be elevated and pressed back against the sacrum, and the entire pelvis seemed filled with a soft, spongy mass. I introduced a Wales' flexible colon bougie into the rectum, but could not pass it beyond eight inches. An aspirator needle was introduced into the tumor felt in the right iliac region, but no fluid was obtained. On the following day, July 28th, the examination was repeated under ether, with like results. Not a particle of gas escaped per rectum while under the anesthetic, although there was complete muscular relaxation. The diagnosis was uncertain; all that could positively be determined was, that the obstruction was caused by a tumor, either uterine or ovarian, which completely blocked up the pelvis, and prevented the passage of anything through the rectum. These facts were stated to the family and the patient, and I was requested to do whatever I thought best under the circumstances. As death was certain unless relief could be speedily obtained, I determined to make an exploratory incision through the abdominal wall to ascertain the nature of the tumor, and remove it, if possible.

July 29th, 11 o'clock A.M.—Present: Dr. E. H. Maynard and others. After anesthesia by ether, an incision was made from the umbilicus to near the pubic bone. Upon introducing my hand, a lobulated mass was felt, which completely filled the smaller pelvis and extended upwards to a level with the crest of the ilium. It was adherent below between the bladder and the uterus, which was pressed backward by it against the sacrum, the rectum being to the left, and tightly compressed against the pelvic brim, and into the left iliac fossæ. The adhesions were easily broken up, and the tumors, which proved to be a cystic sarcoma of both ovaries, were removed by enucleation. One ligature was applied to an artery in the right broad ligament. After cleansing the abdominal cavity with warm carbolyzed water, a drainage tube was introduced, and the wound closed with silk sutures. Great prostration followed the operation; her pulse was small and feeble, and her skin covered with a cold perspiration. She was then placed in bed; bottles of hot water were placed under the blankets, and alcoholic stimulants were given in small quantities at frequent intervals. Reaction occurred so far that she conversed with her friends at intervals for several hours, when she gradually sank and died, twelve hours after the operation, from shock and exhaustion.

The points of interest in this case are many, and not the least among them was the error in diagnosis made by her attending physician. Her menstrual periods had occurred regularly every month up to the time the case came into my hands, and I could discover nothing to base such a diagnosis upon, except the abdominal swelling and the constant nausea. Had a correct

diagnosis been made before the intestinal occlusion became complete and the prostration so great, I think that an operation could have been done with a much greater prospect of success. As it was, the operation was a last resort for the relief of the intestinal occlusion.

Both ovaries were diseased, and the tumors were adherent to each other, as well as in the lower pelvis generally. They did not ascend as they increased in size, as they ordinarily do when not adherent. I learned that after her confinement convalescence was very slow, and that she had "inflammation" at that time. It is, therefore, probable that the ovaries then became adherent and fixed. The position of the tumors *between* the bladder and uterus was also unusual. Peaslee (*Dis. Ovaries*, p. 67) states that "while the cyst still remains in the pelvis it lies *behind* the uterus and in front of the rectum" . . . "In the normal condition, the uterus is *never* behind the cyst during the first stages of its growth." He quotes Boinet as stating "that the bladder is almost always behind the cyst, and the uterus is habitually in front." It is highly probable that this early adhesion of the diseased ovaries in front of the uterus aided largely in causing the occlusion of the rectum by pressing the uterus backwards upon it.

This form of intestinal occlusion must be of very rare occurrence, as its literature is exceedingly scanty. I can only refer to the following two cases: Dr. Barnes (*Diseases of Women*, Am. ed., 1874) quotes a case reported by Dr. Parker in the *Edin. Med. Journ.*, 1863, of obstruction of the rectum by an enlarged ovary. "A dense tumor occupied the space between the vagina and the rectum, almost filling up the upper two-thirds of the pelvis. It could not be dislodged. The gum elastic catheter could not be passed beyond the mass to the promontory of the sacrum. Fluctuation was detected in the mass, and the projecting cysts were tapped per vaginam. The patient ultimately died from the effect of the disease."

It does not appear that the diagnosis in this case was verified by a post-mortem examination.

Dr. Mundé has kindly furnished me with the following quotation from Olshausen's work on *Diseases of the Ovaries*, 1877. After some remarks as to how and when occlusion may occur, he states, "finally when portions of the tumor are adherent in the small pelvis, and compress the rectum completely. In such

a case of a large proliferating cyst, where intestinal occlusion had taken place, I saw colotomy done, but the patient died."

In these three cases, three different methods of relief were adopted: viz., tapping, by Parker; colotomy in Olshausen's case, and in my own, abdominal section; and the result was the same in all—death.

Intestinal obstruction has also been caused by the wrapping or twisting of a long pedicle of an ovarian cyst around a loop of the intestine (Dr. Henry's case in vol. xiii., page 388, of this JOURNAL). At the *autopsy* there was found a small cyst holding a pint of fluid, attached by a pedicle six inches in length to the right ovary. This pedicle was wrapped entirely around the ileum, about twelve inches above the cecum, causing the strangulation. Had laparotomy been done early in this case, it is probable that death would not have occurred. I believe it to be sound surgery to make an exploratory incision through the abdominal walls in all cases of intestinal obstruction, and I am convinced that, by so doing, many lives will be saved that would otherwise perish.

AN UNUSUAL CASE OF VICARIOUS MENSTRUATION.

BY

J. T. GORDON, M.D.,

Carlyle, Ill.

Mrs. H., æt. 41, weight 254 pounds, called at my office to consult me in regard to an umbilical hernia, and during the consultation she incidentally remarked that she was sometimes troubled with a profuse bleeding from her thumb and wished my opinion in regard to it, as she had failed to get a satisfactory reason for the "strange bleeding" from physicians whom she had consulted while it was bleeding, one or two of whom had cauterized it, but to no effect.

After questioning her in regard to it, I gave it as my opinion that it was connected with menstruation and needed no treatment. I requested her to take notice of it in the future and call some time while it was bleeding, which she did, and having reflected on the subject, was enabled to give me the following history of its

occurrence. About seven years ago, it bled three times in as many months, but she becoming enceinte about that time it ceased to bleed and she thought no more of it until after the death of her babe, aged nine months, when upon the restoration of the catamenia the thumb began to bleed as before until again arrested by another pregnancy (twins). Both of these died at seven and nine months respectively, and ever since the thumb has continued to bleed with each returning catamenia for more than three years. She experiences no pain from it while bleeding, but says "it rather feels good." For three or four days, however, before the flow commences she sometimes suffers great pain, producing nausea.

The bleeding is from the inner side of the thumb near the junction of the phalanges and lasts from three to five days, necessitating the frequent changing of cloths which are rapidly saturated with blood.

During the interim of the bleeding, the spot can be recognized only by a slight blueness of the skin over an area not larger than a half pea.

AMERICAN OVARIOTOMIES.

BY

HORATIO R. BIGELOW, M.D.

Washington, D. C.

SOME months ago, I addressed circular letters to the following gentlemen, requesting full answers to a list of questions, which appear below: Drs. Sims, Thomas, Emmet, Goodell, Byford, Noeggerath, Mundé, Bozeman, Homans, Dunlap, Kimball, Murphy, J. Ford Thompson, Chadwick, Ehrich, Skene, Battey, Wilson, Wile, McGuire, Howard, Dawson, Reamy, and some others.

Questions:

- | | |
|---------------------------|---|
| 1. Number of operations. | 8. Anesthetic used. |
| 2. Married or single. | 9. In how many cases was operation commenced and abandoned. |
| 3. Age. | |
| 4. Nature of tumor. | 10. Operation used, laparotomy, etc. |
| 5. Aspiration or not. | |
| 6. Duration. | 11. Listerism or not. |
| 7. Preliminary treatment. | |

- | | |
|--------------------------------|----------------------|
| 12. Size of tumor. Multiple or | 15. After-treatment. |
| not. Adhesions. | 16. Result. |
| 13. Clamp or ligature. | 17. Cause of death. |
| 14. Drainage. | 18. Remarks. |

In addition to these letters, the editors of several medical journals were kind enough to introduce a short notice in their publications, requesting the profession to furnish me with any statistics they might have. The results have been embodied in this paper, which will, I trust, be valuable as the only attempt at a thorough classification of American ovariectomies yet published. I desire to express my grateful appreciation of the kindness of those medical gentlemen, who have taken time from large and remunerative practices to furnish me with their statistics, and to convey my recognition of the courtesy of the editors who aided me. In a just balancing of results, or in the consideration of the death-rate from operations, it is well to bear always in mind that some ovariectomies are commenced, but further procedure abandoned in consequence of unexpected embarrassments. Others are fully finished, though with an almost hopeless result staring the surgeon in the face. An honest list of fully completed ovariectomies will necessarily increase the percentage of fatal results. Many cases of operations instituted, but never carried out, in which the patients eventually die of the disease, are not placed on record. This is unfortunate, because it is unjust to those who tabulate every case or who complete every operation when once attempted. I shall first report the cases as sent me; then give each an individual analysis, and close with a general analysis of all the statistics. The cases are reported in the order in which they were received.

Cases of JOHN HOMANS, M.D., Boston.

Dr. Homans' first five cases were performed without Listerism, and were all fatal.

No.	DATE.	PLACE OF OPERATION.	CONDITION.	AGE.	LENGTH OF INCISION.	ADHESIONS.	TREATMENT OF PEDICLE.	WEIGHT OF TUMOR.	RESULT.	REMARKS.
6	Feb. 27, 1877.	Harney Hosp.	S.	16	4½ in.	Slight and vascular omentum.	Tied in halves with carbolized catgut.	21 lbs.	Recov. rapid.	Well, strong, and working hard in 1878. Catamenia regular since August, 1877.
7	Mar. 30, 1878.	"	S.	20	5 in.	Almost universal to anterior and lateral abdominal parietes.	Do.	29 lbs.	Recov.	Went home at the end of four weeks. Catamenia regular since May, 1878. In November, well and strong; has gained twenty pounds in weight.
8	Aug. 31, 1878.	"	W	58	4 in.	To uterus by strong and thick vascular bands.	Do.	20 lbs.	Recov.	Went home at the end of four weeks.
9	Sept. 17, 1878.	"	W.	60	4 in.	Delicate cellular adhesions to envelope, like those of an easily separable fatty tumor.	No pedicle.	24 lbs.	Recov. immediate.	Went home on sixteenth day.
10	Sept. 29, 1878.	"	M.	24	4½ in.	Slight peritoneal; extensive omental.	Tied as in other cases.	14 lbs.	Recov. rapid.	Went home on twenty-first day. Peritonitis and purulent inflammation of the cyst walls at time of operation. Death from shock in fourteen hours.
11	Nov. 8, 1878.	Boston.	S.	48	4 in.	Strong and intimate to peritoneum, pelvis, mesentery, and intestine.	Do.	42½ lbs.	Death.	
12	Dec. 28, 1878.	Northfield, Vt.	M.	17	5 in.	To intestine and omentum.	Tied with catgut, without transfixion; several circular ligatures applied.	Not determined.	Recov.	A burst papillomatous cyst; peritonitis, with patches of lymph on the peritoneum, and considerable ascites were present. Patient had been vomiting, and had hectic fever for two weeks. A piece of cyst wall, adherent to intestine, was cut out with scissors, and left otherwise undisturbed.

—Dec. 18, 1878.	Stoneham, Mass.	W. 62 5 in.	Exploratory incision.	Tumor not removed.....	Recov.	Tumor solid and lobulated, attached to sacrum, ileum, and uterus. Fluid (40 lbs.) ascitic. No opiate required.
13 Nov. 26, 1879.	Carney Hosp.,	S.. 24 6 in.	Slight.	Tied with carbonized silk, and dropped back.	Recov.	Both ovaries removed. Menstruation regular, but more painful than before ovariectomy. One cyst dermoid.
14 Dec. 21, 1878.	"	S.. 33 4 in.	Omental and intestinal..	Do.	Recov.	
15 Feb. 8, 1880.	Boston	M.. 39 4 in.	None.....	Do.	Recov.	
16 Mar. 7, 1880.	Carney Hosp.,	M.. 28 3 in.	None.....	Do.	Recov.	Cyst of the left broad ligament.
17 Mar. 23, 1880.	Taunton	M.. 37 3½ in.	Slight.....	Do.	Recov.	
18 Apr. 1, 1880.	Carney Hosp.,	S.. 18 5 in.	Universal and intimate to anterior parietes, and slightly to omentum	Tied as above, and burnt off with Paquelin's cautery.	Recov.	Adhesions burnt off with Paquelin's cautery.
19 Apr. 17, 1880.	Fall River ...	M.. 48 3 in.	None.....	Do.	Recov.	
20 Apr. 29, 1880.	Carney Hosp.,	S.. 58 2½ in.	None	Do.	Recov.	
21 May 18, 1880.	Mt. Holly, Vt.	M.. 38 3½ in.	None.....	Do.	Recov.	
22 July 10, 1880.	Boston	M.. 57 4 in.	None.....	Do.	Recov.	
23 July 15, 1880.	Carney Hosp.,	S.. 47 4 in.	None.....	Do.	Recov.	Cyst of left broad ligament.
24 July 31, 1880.	"	M.. 47 6 in.	Intimate and recent to omentum and intestines.	Do.	Recov.	The omentum turned up and laid on a carbonized towel, and the intestines turned downwards towards the pubes during the removal of the cyst.

No.	DATE.	PLACE OF OPERATION.	CONDITION.	AGE.	LENGTH OF INCISION.	ADHESIONS.	TREATMENT OF PEDICLE.	WEIGHT OF TUMOR.	RESULT.	REMARKS.
25	Aug. 1, 1880.	Carney Hosp.	M.	30	3½ in.	None.	Tied as above, and burnt off, with Paquelin's cautery.	25 lbs.	Recov.	Dermoid cyst.
26	Aug. 21, 1880.	"	M.	29	6 in.	Almost universal and recent to parietal peritoneum.	Do.	23 lbs.	Recov.	Papilloma.
27	Aug. 22, 1880.	"	M.	29	6 in.	Slight.	Do.	51 lbs.	Recov.	Forty ounces of serum removed by aspiration from the left thoracic cavity on the fourth day after ovariectomy.
28	Sept. 1, 1880.	Woburn, Mass.	M.	46	8 in.	To peritoneum, small intestine, and diaphragm; firm and old.	Do.	39 lbs.	Death.	Exhaustion on fifth day. Very hot weather.
29	Sept. 2, 1880.	Auburndale.	M.	47	7 in.	None.	Do.	40 lbs.	Recov.	Fluid gelatinous.
30	Sept. 7, 1880.	Carney Hosp.	M.	27	6 in.	Intimate and old, or congenital, to small intestine, mesentery and uterus; in fact, incorporated with them.	Do.	20 lbs.	Death.	Shock. Papilloma.
31	Sept. 23, 1880.	"	M.	33	4 in.	Recent to anterior peritoneum.	Do.	16 lbs.	Recov.	Sixty-five pounds of ascitic and ovarian fluid removed by tapping within the last three weeks before operation.
32	Oct. 2, 1880.	"	S.	48	5 in.	Universal, old and new, to peritoneum.	Do.	38 lbs.		

23 Oct. 6, 1880.	Carney Hosp.	W. 38	3½ in.	Solid, old, to uterus, omental, and pelvic.	Tied as above, and burnt off, with Paque- lin's cautery.	15½ lbs.	Recov.	Cyst more or less enucleated.
34 Oct. 23, 1880.	"	M. 45	2½ in.	None.	Do.	10½ lbs.	Recov.	
35 Nov. 6, 1880.	"	W. 31	2½ in.	None.	Do.	21¾ lbs.	Recov.	
36 Nov. 18, 1880.	"	S. 31	6 in.	To intestine and uterus.	Do.	18 lbs.	Recov.	The portion of the cyst adherent to bowels was cut out and left behind.
37 Nov. 28, 1880.	"	W. 52	3 in.	"	Do.	30 lbs.	Recov.	
38 Jan. 6, 1881.	"	S. 26	5 in.	None.	Do.	14 lbs.	Recov.	
39 Jan. 26, 1881.	"	S. 38	5 in.	None.	Do.	15½ lbs.	Recov.	
40 Jan. 27, 1881.	"	W. 63	5 in.	To both Fallopian tubes and to sigmoid flexure	Do.	9½ lbs.	Recov.	Dermoid cyst. Considerable ascites.
41 Apr. 5, 1881.	"	S. 40	6 in.	None.	Do.	5 lbs.	Recov.	Dermoid cyst, and attached to this a spindle-celled sarcomatous tumor. A uterine fibroid, two pounds weight, also removed.
42 Apr. 14, 1881.	"	M. 40	4½ in.	None.	Do.	36 lbs.	Recov.	
43 Apr. 16, 1881.	"	M. 42	8 in.	Parietal, intestinal, and omental.	Do.	.....	Death.	Died of exhaustion on the third day. Very severe operation. Tumor very vascular and nearly solid. Both ovaries removed.
44 Apr. 17, 1881.	"	M. 29	4½ in.	Strong and old; anteri- only.	Do.	42¼ lbs.	Recov.	
45 May 5, 1881.	"	M. 34	4 in.	None.	Do.	26 lbs.	Recov.	
46 May 22, 1881.	Free Hospital for Women.	M. 39	5 in.	None.	Do.	12 lbs.	Recov.	Much ascitic fluid.
47 May 26, 1881.	Carney Hosp.	M. 42	7 in.	Very vascular; anteri- only and to omentum.	Do.	15 lbs.	Recov.	Considerable hemorrhage during ope- ration.

No.	DATE.	PLACE OF OPERATION.	CONDITION.	AGE.	LENGTH OF INCISION.	ADHESIONS.	TREATMENT OF PEDICLE.	WEIGHT OF TUMOR.	RESULT.	REMARKS.
48	June 8, 1881.	Carney Hosp.	M.	40	4½ in.	None...	Tied as above, and burnt off, with Paquelin's cautery.	10 lbs.	Recov.	Cyst dark blue, very vascular. In appearance resembling the fetal side of a placenta.
49	June 9, 1881	Boston	M.	42	4 in.	None.....	Do.	13 lbs.	Recov.	
50	June 11, 1881.	Carney Hosp.	M.	51	4 in.	None.....	Do.	34½ lbs.	Recov.	
51	June 21, 1881.	Boston	S.	18	4 in.	Anteriorly and to omentum.	Do.	25 lbs.	Recov.	
52	June 30, 1881.	Carney Hosp.	W.	55	6 in.	None.....	Do.	13 lbs.	Recov.	Tumor cancerous.
53	July 7, 1881.	..	S.	30	5 in.	None.....	Do.	8 lbs.	Recov.	Pedicle slipped from clamp before it was burnt off, and in order to pick it up and secure it, the incision had to be enlarged. Cyst of broad ligament.
54	July 11, 1881.	..	M.	23	4 in.	None.....	Do.	11½ lbs.	Recov.	
55	July 25, 1881.	..	S.	14	3 in.	None.....	Do.	11¼ lbs.	Recov.	
56	July 27, 1881.	Boston	S.	49	3 in.	None.....	Do.	12 lbs.	Recov.	Both ovaries removed.
57	Sept. 1, 1881.	Carney Hosp.	S.	24	3 in.	None.....	Do.	2½ lbs.	Recov.	Cyst of the left broad ligament.

58 Sept. 8, 1881.	Carney Hosp., S.	25	7 in.	None.	Tied as above, 13 lbs. and burnt off with Paquelin's cautery.	Death.	Cause of death: acute mania on the eighth day. A careful autopsy, by Dr. W. W. Gannett, showed everything healthy and going on well in the peritoneal cavity. Hereditary insanity in the family. Dermoid cyst.
59 Sept. 11, 1881.	"	M. 41	5 in.	Anteriorly to parietes and to uterus.	Do.	33 lbs. Recov.	
60 Sept. 18, 1881.	"	W. 51	3½ in.	Anteriorly to parietes.	Do.	39 lbs. Recov.	
61 Sept. 27, 1881.	Taunton, Mass.	M. 60	5 in.	None.	Do.	10 lbs. Recov.	Some ascites.
62 Oct. 4, 1881.	Boston	M. 45	7 in.	Universal anteriorly and laterally.	Do.	80-90 lbs. Recov.	Considerable ascites, which is counted in the weight.
63 Oct. 5, 1881.	Boston	W. 45	6 in.	None.	Do.	22 lbs. Recov.	Both walls of bladder incised. No ill effects.
64 Oct. 24, 1881.	Merrimac, Mass.	S. 57	6 in.	Intestinal.	Do.	5½ lbs. Recov.	A portion of sac adherent to bowels left behind.
65 Oct. 29, 1881.	Boston	M. 48	4 in.	Slight lateral and anterior.	Do.	49 lbs. Recov.	
66 Nov. 15, 1881.	"	W. 47	3½ in.	None.	Do.	25½ lbs. Recov.	
67 Nov. 19, 1881.	Concord, N.H.	W. 73	6 in.	To peritoneum, omentum, and intestine.	Do.	20 lbs. Recov.	The age of the patient did not prevent a very rapid recovery, 99.4° F. being the highest temperature.
68 Dec. 1, 1881.	Provincetown, Mass.	M. 52	6 in.	Burst cyst.	Do.	35 lbs. Recov.	Abdomen filled with gelatinous material—colloid—which had originally come from a burst dermoid cyst.
69 Dec. 18, 1881.	Free Hospital for Women.	S. 30	7 in.	To intestine and pelvic peritoneum.	Do.	10 lbs. Death.	Both ovaries removed. The outer surfaces of the tumors of a brown color, and beginning to decay.

"The above list contains all the cases of completed ovariectomy that I operated on from February, 1877, to December 18th, 1881. Besides these completed cases, I have made three exploratory incisions, and closed the wound after thoroughly investigating the tumor. All of these cases recovered: so that we have for completed and attempted ovariectomies thirty-five cases, with three deaths (for 1881.) I have also operated for the removal of uterine tumors three times. Once successfully (Case 41 of this table), and twice with a fatal result, both of the latter being incompleated operations. One of the deaths in this table (No. 58) ought not to be accounted a death from ovariectomy, for everything in the abdominal cavity was going on well, as shown by autopsy. The patient's parents and family were more or less insane, and she developed acute mania, with the delusion that she had committed the unpardonable sin, and that there was no forgiveness for her. It would be improper not to report the case, however, and so I have called it a death from ovariectomy. Clinically, the wounding of the bladder in No. 63, without the least unfavorable consequence or the slightest retardation of convalescence, and the age of No. 67 (seventy-three years), with a normal and rapid recovery, are worth noting. I have also done colotomy successfully, making the permanent opening in the pubic region."

Of the employment of Listerism, Dr. Homans says:

"These cases, so far as they go, are a proof of the great value of the antiseptic method, or Listerism. I like this latter name because it is concise and identifies Lister's name with the magnificent principle which he has discovered and the method which he has introduced. The number of cases is small, but I am very sure that the percentage of recoveries is much higher than it would have been without Listerism, and the ratio is about what may be expected in cases done antiseptically by an experienced operator."

Concerning the use of the clamp and ligature, he writes as follows:

"I generally cut out and leave behind any portion of the cyst intimately adherent to a coil of intestine; it is better to do this than to run the risk of rupturing the bowel or causing hemorrhage from its surface, which it is not easy to control. I have always followed Mr. Spencer Wells' advice not to yield to the

temptation to remove a fibroid from the uterus during an ovariectomy; the desire to do so is very strong, but I think the safer way is to leave them alone, and, although I have once or twice seen them well pediculated, I have not meddled with them. I always compress the pedicle with Dawson's clamp (a very simple and powerful instrument, which has done me good service); then burn off the pedicle with Paquelin's cautery; tie with a double ligature (*in the sulcus made by the clamp*); remove the clamp, and drop the stump. I do this because two of the most successful operators, Drs. Keith and Bradford, have used, one the cautery and the other the ligature, and so I use both. I dare say that either would be sufficient, but I see no objection to my method, and am satisfied with it. I never use catgut for tying the pedicle, but always carbolyzed silk. I lost a case from hemorrhage after tying with catgut, and have never used it since."

Cases of DR. J. MARION SIMS, *New York.*

STEAMER GERMANIA, OFF QUEENSTOWN,)
November 1st, 1881.)

MY DEAR DR. BIGELOW:—I am truly sorry I cannot give you the information you wish about my ovariectomies. I have been moving over the world so rapidly and so often in the last five years that I fear I have lost my records entirely. I can only say that I have not lost a case since I began the use of Listerism—twelve cases. I have operated in all forty-five times, with nine deaths. These deaths all occurred between the eleventh operation and the thirty-third, while I was connected with the Woman's Hospital. Thus:—Thirty-three operations and nine deaths before Listerism; twelve successful operations under Listerism. Gave ether in every case except three, to whom I gave nitrous oxide gas—one of these under gas one and a half hours, another nearly one hour, another twenty minutes. The cause of death in every case was septicemia, except one, which died of peritonitis.

Cases of DR. W. H. BYFORD, *Chicago.*

CHICAGO, November 24th, 1881.

DEAR DOCTOR:—Your letter of the 18th inst. is received. I commenced operating for the removal of ovarian tumors in 1861. The first ten years I only operated about twenty-five times. The notes of these were burned in the great fire of

1871. Since then, I have operated sixty-nine times, making in all ninety-four operations. In the first sixty-two, I used chloroform as an anesthetic, and, when practicable, used the clamp: in the other cases, I tied with silk and returned the pedicle, allowing the ligature to hang out of the wound large enough to act as a drainage, like a siphon. I did not employ any of the processes belonging to the antiseptic method in these sixty-two cases. In these were included, monocystic, polycystic, and several dermoid tumors. The results in these cases were 66 per cent of recoveries. The deaths were from shock, exhaustion, and peritonitis. Within the last two years, I have operated thirty-two times, and have used sulphuric ether as the anesthetic exclusively, as also the antiseptic measures, as detailed in the last edition of my book on diseases of women. In that number, I have met with almost every variety of tumor. All had been tapped or aspirated by others or myself. The preliminary treatment, where any was employed, consisted in such measures as would improve the blood—tonics and full nutritive diet. In all of these, I ligated the pedicle with strong silk, cut the silk short, and returned the whole, closing the wound. Employed no drainage. The patients were married and unmarried, and of all grades of social position. Thirty of these recovered, and four died. The operation was the abdominal section. Two of the four which proved fatal died of exhaustion, one from septicemia, and one other from a peculiar condition of the blood, in which hemorrhage from the wound showed that fluid to be entirely incapable of coagulation. Several of the above cases were double ovariectomies: one of these was cured of epilepsy of twelve years' standing.

ANALYSIS:—Total number of operations, 94. Percentage of recoveries in first sixty-two cases, 66—in the last thirty-two cases, 87. Average total percentage of recoveries, 76+. Listerism employed in 32 cases. In thirty-two cases, the operation was preceded by tapping or aspiration.

Cases of DR. H. P. C. WILSON, *Baltimore.*

1. Number of operations. 9.
2. Ages. 32, 56, 39, 56, 40, 19, 38, 36, 31.
3. Married or single. 7 married, 2 single.
4. Nature of tumor. 3 compound multilocular, 2 single cyst, 4 multilocular.

5. Tapping prior to operation or not. 2 tapped, 7 not tapped.

6. Preliminary treatment. Brisk purgative second night before operation. Sometimes an opiate, oftener bromide of potash in large doses; night before the operation, 15 or 20 grains quinine; on the morning of the operation, a good glass of milk two or three hours before the operation, and an ounce of whiskey just before the chloroform.

7. Anesthetic used. Chloroform always.

8. Listerism or not. Listerism in 4; not, in 5.

9. Size of tumors. 42 lbs., 26, 30, 25, 20, 33, 28, 50, 35.

10. Adhesions. Very extensive in 4, moderately so in 3, not at all in 2.

11. Ligature or clamp. Clamp first 5, ligature last 4.

12. Drainage. Not a single case.

13. Results. 7 recovered, 2 died; 1 death was from cancer.

14. Cause of death. Shock.

15. Duration of operations. Average, 1 hour.

16. Remarks. In one case, the operation was performed when four months advanced in pregnancy. Another recovered and went to term, and was safely delivered of a healthy child, now living. One fatal case was that of a woman who had been repeatedly tapped, and was near to death before she was brought to me for an operation. I operated as the only hope (though slim). Both fatal cases had been tapped—one was a single cyst of forty-two pounds, the largest single cyst, but one, that I have found on record.

ANALYSIS:—Number of operations, 9. Average age, 38 years. Listerism in 4 cases. Percentage of recoveries, 77+. Average size of tumors, 32 lbs.

Cases of DR. P. J. MURPHY, *Washington, D. C.*

1. Number of operations. 8.

2. Married or single. 3 single, 5 married.

3. Nature of tumor. 6 multilocular.

4. Tapped or not. 5 tapped prior to operation, 3 not tapped.

5. Preliminary treatment. No preliminary treatment.

6. Anesthetic used. Squibb's sulphuric ether.

7. Operation. Laparotomy.

8. Listerism or not. Listerism in 3 cases.

9. Weight of tumors. Tumors varied from 16 to 46 pounds,

Adhesions in all cases, in 6 very slight, especially in those tapped prior to operation.

10. Ligature or clamp. Ligature in every case.

11. Drainage or not. Drainage.

12. Results, 7 recoveries, 1 death.

13. Cause of death. Pneumonia.

14. After-treatment. The after-treatment consisted in keeping the room at an equal temperature of 85°. Liquid diet, consisting of milk, gruel, beef-tea, and stimulants if necessary. Opium was not administered unless much pain was complained of, and then it was given in rectal suppositories (Morphine sulph., gr. $\frac{1}{4}$; Ext. belladonnæ, gr. $\frac{1}{6}$). If the bowels were not moved after the fifth day, an enema of soap-suds with hot olive-oil was administered. In two cases where the carbolized catgut ligature was used to close the incision, ventral hernia followed, owing to the too quick absorption of the gut. I have since used silver wire.

ANALYSIS.—Recoveries, 7; deaths, 1; percentage of recoveries, 88.

Cases of DR. WM. C. WILE, *Sandy Hook, Ct.*

1. Number of operations. 3.

2. Ages. 44, 49, 53.

3. Nature of tumor. 2 unilocular, 1 multilocular.

4. Tapping or not. 1 tapped thirteen times, 1 not tapped, 1 tapped once.

5. Preliminary treatment. Supporting treatment, paying especial attention to the regulation of the secretions.

6. Anesthetic used. Squibb's ether.

7. Operation. Laparotomy.

8. Listerism or not. No Listerism.

9. Size of tumor. 1 medium, 1 large, 1 very large.

10. Adhesions. Extensive in 1 case, moderate in others.

11. Ligature or clamp. Ligature.

12. Drainage or not. No drainage.

13. Results. All recovered.

Drs. Anita E. Tyng, of Providence, Rhode Island; E. E. Montgomery, of Philadelphia; and G. R. Skinner, of Cedar Rapids, send reports of successful operations, each one case. Listerism used in all three cases.

*Cases of DR. HUNTER MCGUIRE, Richmond, Va.**Cases of Dr. Hunter McGuire, Richmond, Virginia.*

No.	MEDICAL ATTENDANCE.	DATE.	CONDITION.	ADHESIONS.	TREATMENT OF PEDICLE	WEIGHT OF TUMOR.	LENGTH OF INCISION.	RESULT.	SUBSEQUENT HISTORY.	LISTERISM.	NATURE OF TUMOR.	ANESTHETIC.	DURATION OF OPERATION.	AGE.
1	Hosp. . .	July 1, 1871.	M.	Visceral, omental, parietal.	Ligat.	80 lbs. . .	6 in. . .	Died in 16 hrs.	Shock	No	Cystoid cancer	Chloro- form	1 $\frac{3}{4}$ hrs	52
2	" "	May 27, 1873.	S.	Parietal	Clamp	60 lbs. . .	Not rec.	Recov.	Well	Drainage No.	Multiloc.	Do.	35 min.	48
3	Not rec.	Aug. 30, 1873.	M.	Extensive parietal	"	35 lbs. . .	5 in. . .	"	Died of fever in 1874.	Drainage	Ovarian cyst.	A. C. E.	Not rec.	45
4	Hosp. . .	Oct. 2, 1873.	M.	Extensive visceral and parietal.	"	40 lbs. . .	Not rec.	Died . .	Exhaustion	No	Multiloc. cyst.	"	"	49
5	Not rec.	Dec. 11, 1875.	M.	Parietal	"	Not rec.	3 $\frac{1}{2}$ in. . .	Recov.	Still living and well	No	Not rec.	Not rec.	40 min.	30
6	" "	June 12, 1876.	S.	"	"	58 lbs. . .	Not rec.	"	Died of cancer of stom. 13 ms. after	No	Multiloc cyst.	A. C. E.	Not rec.	25
7	" "	Sept. 19, 1876.	S.	Visceral and parie- tal.	"	45 lbs. . .	7 in. . . .	"	Well in 1879.	No	Do.	"	1 $\frac{1}{2}$ hrs	21
8	" "	Jan. 19, 1877.	S.	Extensive visceral and parietal.	"	Not rec.	Not rec.	"	Died six months after.	No	Colloid cancer.	"	Not rec.	27
9	Hosp. . .	Oct. 23, 1878.	M	Slight	"	"	"	"	Still well	No	Multiloc. cyst.	"	"	--
10	" "	Dec. 31, 1878.	M.	None	"	"	"	Died . .	Peritonitis 3d day.	No	Do.	"	"	50
11	" "	Dec. 27, 1878.	M.	Slight	—	"	"	"	Exhaustion 3d day	No	Do.	"	"	54
12	" "	Mar. 5, 1880.	M.	None	Clamp	40 lbs. . .	"	Recov.	Still well	Yes	Uniloc. cyst.	C. & E.	"	40

No.	MEDICAL ATTENDANCE.	DATE.	CONDITION.	ADHESIONS.	TREATMENT OF PEDICLE.	WEIGHT OF TUMOR.	LENGTH OF INCISION.	RESULT.	SUBSEQUENT HISTORY.	LISTERISM.	NATURE OF TUMOR.	ANESTHETIC.	DURATION OF OPERATION.	AGE.
13	Hosp.	Nov. 15, 1880.	S.	Omental	Ligat.	20 lbs.	3 in.	Died.	Exhaustion 2d day	Yes.	Dermoid cyst.	C.	40 min.	21
14	"	May 6, 1880.	S.	Visceral and parietal.	"	15 lbs.	3 in.	"	Shock and exhaustion 19 hrs. after	Yes.	Cystoid cancer.	C.	2 hrs.	25
15	"	Nov. 2, 1881.	M.	Visceral and parietal.	"	100 lbs.	Not rec.	"	Bronchitis and peritonitis 7th day	No.	Uniloc. cyst.	C.	1 hr.	33
16	"	Mar. —, 1878.	S.	None.	"	Not rec.	2½ in.	Recov.	Well	Yes.	Not rec.	C.	Not rec.	21
17	"	Mar. —, 1878.	S.	None.	"	"	2½ in.	"	Well	Yes.	Multiloc. cyst.	C.	40 min.	26
18	"	May 1, 1880.	S.	None.	"	"	2½ in.	"	Well	Yes.	Do.	C.	40 min.	27
19	"	July 24, 1871.	M.	Visceral and omental.	"	"	5½ in.	"	Well	No.	Fibro-cist uterus.	C.	2 hrs.	24

Case 19 is fully reported in the *Philadelphia Medical Times*, 1871, in which Dr. McGuire cites all the cases of fibro-cysts of the uterus which he could find up to that period.

Analysis of Dr. McGuire's Cases.

Total number of cases, 19. Married, 10; single, 9. Average age, 34 years 4 months. Average weight of tumors reported, 49 pounds. Ligature in 8 cases, clamp in 11 cases. Listerism used in 6 cases; drainage in 2 cases; of the 6 cases in which Listerism was used, 2 resulted fatally. Results: deaths, 7; recoveries, 12.

Dr. EDWARD BORCK, of St. Louis, reports two cases of ovariectomy, one successful and one unsuccessful. Listerism used in both cases.

Cases of Dr. T. Gaillard Thomas, New York.

Report of Dr. T. G. Thomas's cases of completed ovariectomy extending over a period of eighteen years, from 1863 to 1881. All cases are reported except those in which removal of the tumor was found to be impossible.

Number of completed ovariectomies.	199
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Single,	65
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Married,	134
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Age. Youngest, 13 years; oldest, 69 years.

Nature of tumor. 17 carcinoma or cysto-carcinoma, 7 dermoid cysts, 3 ovarian fibroids, 10 parovarian cysts, 25 ovarian monocysts, 10 solid colloid tumors, 127 multilocular colloid cysts.

Anesthetic. Bichloride of methylene, 2 cases; nitrous oxide gas, 2 cases; chloroform, 8 cases; ether, 187 cases.

Listerism employed in about 67 cases.

Clamp used in 103 cases; ligature in 96 cases.

Entire uterus removed four times with ovarian cystoma.

Adhesions existed in all but 50 cases.

Long incision in 25 cases; short in 118; medium in 56.

Results: 49 deaths; 150 recoveries.

Causes of death: Acute mania, 2 cases; tearing away of pedicle on fourteenth day by violent effort, 1 case; persistent vomiting, 2 cases; hemorrhage, 3 cases; capillary bronchitis, 2 cases; pneumonia, 1 case; exhaustion, 1 case; uremic convulsions, 1 case; shock, 3 cases; septicemia, 22 cases; peritonitis, 10 cases; gangrene of intestines, 1 case.

After-treatment. The patient is kept free from pain by opiates, administered by mouth, bowel, or skin; given beef-juice and milk as nutriment; and high temperature is controlled by quinine in large doses, by mouth or rectum, and by Kibbee's method of cold affusion.

The profession will notice the large percentage of cancers in these cases of Dr. Thomas. It is often customary to leave out any mention of such cases in ovariectomy tables. Honest tabulation, however, demands that everything should be reported.

Since going to press, Dr. Thomas has had four successful cases of ovariectomy, bringing his total up to 203 cases. He has also completely removed the uterus in eleven cases, with six recoveries and five deaths. It seems to me that such results furnish the best answer to the denunciation of this operation by Dr. Richet, before the Academy of Medicine at Paris. Dr. Thomas writes: "There are three circumstances under which complete extirpation of the uterus may now be regarded as legitimate and often a necessary procedure: first, where it is, after Freund's method, removed on account of malignant disease; second, where, as an addendum to the Cesarean section, it is practised after Porro's plan; and third, where it is extirpated to render practicable the removal of tumors, either of solid or cystic character, which take their origin in its tissues, or arising in the ovaries, form attachments to it too firm to be broken."

Cases of Dr. PAUL F. MUNDÉ, New York.

Number of operations, 3; recoveries 2; one monocyst, one polycyst, and one cyst of broad ligament. Ages: 33, 45, 22.

I. Nov., 1875. Single, 33 years. Monocyst. Aspiration followed by peritonitis, inflammation, and suppuration of cyst. Ovariectomy on eighth day. P. 120; T. 102. Marked improvement after operation. Clamp; drainage; frequent irrigation of peritoneal cavity. Did well until fifth day, when pyemic parotitis of right side developed. Death of septic pyemia on sixth day.

II. Jan., 1882. Married, 22 years, nullipara. Supposed monocyst of ovary. Not tapped. On operation proved to be cyst of right broad ligament. Bulk of cyst was removed, remainder sewed into abdominal wound. Drainage-tube. Contents of cyst about 10 pints. Recovery. March 15th, wound closed, all but slight fistulous opening at sac.

III. March, 11, 1882. Married, 45, multipara. Large semi-solid polycyst, simulating fibrocyst of uterus. Not aspirated, except at operation. Previous spontaneous rupture of one cyst ; no reaction. Large adhesions to bladder, omentum, etc. Pedicle dropped ; ligature and Paquelin. Tumor, 34 lbs. Listerism, except spray. Sutures removed on twelfth day. Recovery.

Cases of DR. G. KIMBALL, *Lowell, Mass.*

Number of operations. 267.

Results. Recoveries, 202 ; deaths, 65.

Average age. 40 years 9 months.

Married. 203.

Nature of tumor. Multilocular, 196 ; unilocular, 69 ; solid, 2.

Adhesions. 187 ; involving uterus, 4.

Ruptured cysts. 11 (5 recoveries).

Both ovaries removed and diseased. 8.

Tapped or aspirated. 35.

No pedicle (involving broad ligament). 4.

Pedicle ligated, stump dropped back, and ligature brought outside, 85.

Pedicle ligated, stump dropped back, and ligature cut short, 24.

Clamp, 158.

Treatment. Antiseptic, carbolic spray, 75.

Cause of death. Tetanus, 5 ; secondary hemorrhage, 2 ; shock, 2 ; nephritis, 2.

Septicemia or peritonitis (or both). 156.

Renal hemorrhage. 2.

In two cases ovariectomy was performed twice on the same person ; in one instance the second operation was after the lapse of thirteen months. In the second instance the operation was performed after the lapse of thirteen years. Recoveries from second operation in both cases.

Cases of DR. A. DUNLAP, *Springfield, Ohio.*

SPRINGFIELD, OHIO, January 23d, 1882.

Dr. Bigelow.

DEAR DOCTOR:—I have performed ovariectomy 169 times. First operation, September 17th, 1843 ; the last, January 11th, 1882. Successful operations, 134 ; unsuccessful, 35. Both ovaries removed at one operation 4 times, with 3 recoveries and 1 death. Both ovaries removed at two operations, five years apart. Unmarried at time of first operation ; married three years at time of second. Recovery. One operation

for one ovary and one subperitoneal fibroid at the same time. Result—recovery. The fibroid about the size of a hen's egg. The smallest tumor weighed fourteen pounds; the largest weighed one hundred and thirty-six pounds. One fibroid and bony tumor of the ovary, with small pedicle, weighed one hundred and six pounds. One operation not concluded on account of the malignant nature of the growth. Have had two patients bear twins after one ovary was removed. In both cases there was one male and one female. One successful operation after a failure to remove a tumor occurred. Cicatrix six inches long. Recovery. . . .

Literature of Sporadic Cases, 1878-1881.

DATE	NAME OF OPERATOR OR REPORTER.	JOURNAL.	DATE	NAME OF OPERATOR OR REPORTER.	JOURNAL.
1878	Chas. T. Reber.	Col. & Clin. Rec.	J'y	E. P. Bennett..	Ibid.
"	I. S. Cleveland	Cin. Lan. & Clin.	"	W. W. Dawson	Ob. Jour. Cin'ti.
"	L. P. Davis....	Med. & Sur. Rep.	"	W. T. Ridenour	Toledo M. & S. J.
"	G. J. Engel- mann.	Am. Jour. Ob.— 3 cases.	"	J. J. Sternreide	Med. & Sur. Rep.
"	W. B. Erdman	Cin. Med. News.	"	Mary H. Thomp- son.	Ibid.
"	S. M. Thompson	Trans. Tenn. Med. Soc.	Aug	None.	
1879	H. C. Wyman.	Detroit Lancet.	Sep.	J. I. Dyer.....	Medical Record
Jan	E. T. Blackwell	Med. & Sur. Rep.	"	T. Lipscomb...	Tr. Med. S. Tenn.
Feb	W. S. Brown...	Boston Med. & Surg. Jour.	"	E. E. Montgom- ery.	Med. & Sur. Rep.
"	J. Eliot.....	Nat. Med. Rev.	"	J. Rivers.....	Pacific M. & S. J.
"	Mary H. Everett	U. O. Med. Inv't.	"	C. Shepard...	Detroit Lancet.
"	H. L. Hodge...	Tr. Path. S. Phil.	"	A. Van DeVeer	Hosp. Gazette.
"	D. Prince.....	Rich. & Louis- ville Med. J.	"	T. B. Wilkerson.	Va. M. Monthly.
Mar	L. McLean....	Medical Record	Oct.	A. L. Clark....	Chi. Med. Times
Apr	W. H. Baker...	Boston Med. & Surg. Jour.	"	Ed. Ohio Med. Record.	2 cases.
"	W. H. May....	Western Lancet	"	L. L. Slator...	N. C. Med. J.
May	G. Dowell.....	Va. M. Monthly.	"	B. W. Taylor...	Tr. S. C. Med. Ass
"	E. S. Dunster...	Mich. Md. News	Nov	E. T. Blackwell	Tr. Med. So. N. J.
"	Engelmann...	Am. Jour. Ob.	"	R. M. Delzell...	American Prac.
"	J. Fewsmith, Jr.	Ibid.	"	T. M. Drysdale	Am. Jour. Ob.
"	Gillette.....	Ibid.	"	T. A. Emmet...	Ibid.
"	J. B. Hunter...	Medical Journ.	"	O. A. Horr....	Tr. Maine M Ass
"	W. T. Lusk...	Am. Jour. Ob.	"	C. C. Lee.....	Am. Jour. Ob.
"	Noeggerath....	Ibid.	"	A. R. Smart...	Toledo M. & S. J.
"	W. Varian....	Med. & Sur. Rep.	"	J. M. Snook...	Mich. Md. News.
J'ne	Bernays.....	St. Lo. M. & S. J.	Dec	W. H. Baker...	Boston M. & S. J.
"	Engelmann....	Tr. Med. S. Phil.	"	W. H. Mays...	Western Lancet
"	C. C. Lee.....	N. Y. Med. J.	1880		
"	W. H. Parish...	Tr. Ob. Soc. Phil.	Jan	J. Byrne.....	Proc. Med. Soc. Kings Co., Brooklyn.
"	C. Shepard....	Detroit Lancet.	"	D. Eve.....	Southern Prac.
"		10 cases; 6 rec., 4 deaths.	Feb	D. Maclean...	Tr. Mich. M. Soc.
"	A. R. Smart...	Med. & Sur. Rep.	"	H. H. A. Beach	Boston M & S J.
			"	G. E. Bensom.	Medical Record

DATE	NAME OF OPERATOR OR REPORTER.	JOURNAL.	DATE	NAME OF OPERATOR OR REPORTER.	JOURNAL.
1880			Dec	W. Lomox	Tr. Ind. Med. So.
Feb	F. D. Cunningham.	Va. M. Monthly.	"	J. Robbins. . . .	Med. & Sur. Rep.
Mar	W. F. McNutt.	Western Lancet	1881		
"	W. Fox.	Tr. Wis. M. Soc.	Jan	E. C. Mann. . . .	Medical Record
"	K. Hoegh.	Ibid.	"	M. Michel. . . .	N. C. Med. Jour.
"	W. N. King. . . .	Ohio Med. Rec.	"	Noeggerath. . . .	Medical Record
"	W. T. Lusk. . . .	N. Y. Med. Jour.	"	T. P. Seeley. . . .	Chic. M. J. & Ex
"	H. Palmer.	Tr. Wis. M. Soc.	Feb	Bernarp.	St. Lo. M. & S. J.
"	L. J. Wireback. . .	Med. & Sur. Rep.	"	A. E. Bigelow. . .	Med. & Sur. Rep.
Apr	W. T. Briggs. . . .	Nashville Jour.	"	Garrigues.	Medical Record
"		M. & S.	Mar	S. T. Davis. . . .	Tr. Med. So. Pa.
"	O. O. Burgess. . .	Western Lancet	"	I. A. Ray.	Ann. Anat. & S.
"	A. F. Cabot. . . .	Boston M. & S. J.	"	Reamy.	Obs. Gazette.
"	C. C. Lee.	Medical Record	Apr	T. G. Morton. . .	Penn. Hos. Rep.
"	W. Lomax.	Cin. Lan. & Clin.	"	J. H. Van Eman. .	St. Lo. Cour. Med
May	W. F. McNutt. . .	Western Lancet	May	W. H. De Witt. . .	Obs. Gazette.
"	W. F. Atlee. . . .	Am. J. Med. Sci.	"	W. T. Helmuth. . .	Med. & Chir. Qu.
"	H. Clarke.	Boston M. & S. J.	"	J. B. Hunter. . . .	N. Y. Med. Jour.
"	W. R. Gillette. . .	N. Y. Med. Gaz.	"	Geo. Porter. . . .	Tr. R. I. Med. As.
"	C. C. Lee.	Medical Record	"	C. B. Powell. . . .	N. Y. & Chicago
"	— Whitwell. . . .	Western Lancet	"		Med. & Sur. J.
"	J. H. Wyeth. . . .		"	S. S. Todd. . . .	Kan. Med. Index
J'ne	Batley.	British M. & S. J.	J'ne	W. T. Helmuth. . .	N. Y. Med. Times
"	G. J. Engelm.	Boston M. & S. J.	"	T. B. Wilberson. .	Va. M. Monthly.
"			J'ly	R. F. Bang.	Medical Record
"	W. R. Gillette. . .	N. Y. Med. Gaz.	"	D. Campbell. . . .	Boston M. & S. J.
"	C. A. Kirkly. . . .	Toledo M. & S. J.	"	P. Gresham. . . .	Am. M. Bi-wkly
"	C. C. Lee.	Medical Record	"	W. O. Roberts. . .	American Prac.
"	G. C. Smythe. . . .	American Prac.	"	E. Younkin. . . .	Am. Med. Jour.
J'ly	Gregory.	St. Lo. M. & S. J.	"		St. Louis.
Aug	W. F. Atlee. . . .	Am. J. Med. Sci.	Aug	P. P. White. . . .	Buffalo M. & S. J.
"	T. M. Drysdale. . .	Tr. Ob. Soc. Phil.	"	T. B. Wilkerson. .	N. C. Med. Jour.
"	T. A. Emmet. . . .	Am. Jour. Ob.	Sep.	B. F. Dawson. . .	Am. Jour. Ob.
"	W. T. Lusk. . . .	Ibid.	"	T. E. Satterthwaite.	Medical Record
"	S. S. Wells.	Tr. Am. Gyn. So.	"	P. V. Schenck. . .	Am. Jour. Ob.
Sep.	E. Miller.	Louisville Med.	Oct.	N. M. Baskett. . .	St. Lo. M. & S. J.
"		ical News.	"	J. M. Batten. . . .	Pittsburgh M. J.
Oct.	W. F. Cheno- with.	Gaillard's Med- ical Journal.	Nov	G. J. Engelm.	Trans. Am. Gyn
"	Gregory.	St. Lo. Cour. Med	"		Soc.—2 cases.
Nov	Bardwell.	Cin'ti Ob. Gaz.	"	Geddings.	
Dec	J. L. Crawford. . .	Medical Record	"	J. F. Heustis. . .	Tr. Med. Ass. Ala
"	F. W. Entriken. . .	Toledo M. & S. J.	"	W. B. Rogers. . .	Miss. Val. Med.
"	P. L. Hilsman. . .	Tr. Ga. Med. Ass.	Dec	None.	Month.—3 cases

Cases of DR. WM. GOODELL, Philadelphia.

PHILADELPHIA, January 15th, 1882.

MY DEAR DR. BIGELOW:—With this letter I send you a table of every one of my cases of ovariectomy. I am too busy to write as fully on the subject as you asked me; but in justice to myself a few explanations are needed.

In the first place: I have had but two cases of exploratory incision, in which the tumor proved to be ovarian, and in which

the operation was not undertaken. In each there was extensive malignant disease of the peritoneum and of all the pelvic organs. One of them was a patient of Dr. R. Horner, of Gettysburg, Pa., the other a patient of Dr. J. A. Murphy, of Wilkesbarre, Pa. The former recovered from the operation; the latter died a few days later from intestinal obstruction, but whether due to the operation or not is uncertain.

Secondly, in not a single instance have I ever begun an operation without wholly completing it by the removal of the cyst. In other words, I have not one incompleated or one abandoned operation to report.

Thirdly, I have always contended that, for a surgeon to decline to operate on any case of ovarian tumor because it is not a promising one, is virtually the same thing as if he had operated on the case and had lost it. Acting on this principle, no matter how desperate the condition of the woman, I have, in not a single instance, refused to give the sufferer her only chance for life. In this statement, I am sure that Drs. Mays, Marcy, Deal, Harlow, Dawson, Baer, Shaeffer, and Sheppard will bear me out. This regard for the woman, and disregard for my statistics, has swelled my list of fatal cases, and has given me one death on the operating table; but, on the other hand, it has enabled me to restore to life two women who had been abandoned by other surgeons.

I have also labored under the other disadvantages of having performed many of my operations in a general hospital, viz., that of the University of Pennsylvania, and a large number of them at such a distance from Philadelphia that I did not again see the woman after the operation. I have also repeatedly performed the operation in the country, with no other assistants than those who had never even seen the operation. All these facts must, therefore, be taken into consideration before a just comparison can be made between my results and those of other operators who have special hospitals for the purpose.

Of my sixty-one cases, up to date, twenty-two were operated upon in a general hospital with six deaths. Eighteen were operated upon at their homes, but too far away for me to attend them afterwards; and of these, seven died. Eleven were operated on at home, and had my subsequent care; of these I lost four. Ten were operated on at my private hospital with but one death. This single fatal case in my private hospital

was one of malignant disease of both ovaries. They were everywhere adherent, and, in addition, had so coalesced that the womb was imbedded in the mass, and had to be enucleated. Dr. R. P. Harris, who witnessed this operation, deems it the most difficult one of the many he has seen. Had a drainage-tube been used, the woman would probably have recovered, only, however, to have died at a later period from a return of the disease. My private hospital is so near me that I am able to see my patients at least four times a day, until the period of danger is passed. By being on hand to meet the emergencies, I have on two occasions saved the life of my patient. To this fact, and to that of its being a special hospital, and, therefore, aseptic, do I attribute this success.

I have not yet given up the spray, nor shall I do so until Keith, now that he has abandoned its use, can report another series of seventy-odd successive cases of recovery. While it may not be essential in private practice, I do not see how it can be dispensed with in the foul wards of a general hospital.

In conclusion, as I look back upon my cases, and contrast the mortality of my earlier operations with the better showing of my later ones, I am more than ever impressed with the conviction that in no other capital operation does a growing experience tell more than in that of ovariectomy.

Very faithfully yours,

WM. GOODELL.

No.	NAME OF PREVIOUS MEDICAL ATTENDANT.	AGE.	CONDITION.	NUMBER OF CHILDREN.	PREVIOUS TAPPINGS.	DATE OF OPERATION.	PLACE OF OPERATION.	ADHESIONS.	SIDE & TREATMENT OF PEDICLE.	SIZE AND NATURE OF TUMOR.	LENGTH OF INCISION.	DRAINAGE.	RESULT.	CAUSE OF DEATH.	REMARKS.
1	Dr. B. F. Baer, Philadelphia.	40 M.		3	...	Sept. 28, 1876.	Hosp.	Parietal and omental.	L. clamp.	30 lbs.	Short.	Cloth-tent.	Recov.	....
2	Dr. W. S. Stewart, Philadelphia.	22 S.	...	...	2	Mar. 14, 1877.	Hosp.	Pelvic...	L. Ligat.	2 lbs.	"	Ligat.	"	.....	Cyst removed by vaginal incision. The ends of the ligature were brought out of the wound for drainage purposes.
3	Dr. J. M. Ridge, Camden, N. J.	50 M.		4	38	Mar. 22, 1877.	Home.	Omental, parietal and pelvic.	L. Clamp	4 lbs., fibroid of ovary.	Long.	...	Death	Inter-nal hemorrhage.	Did well for twelve days, when she secretly got out of bed, and was seized with pain and collapse.
4	Dr. H. H. Longstreet, Borden-town, N. J.	24 S.	...	...	1	Oct. 23, 1877.	Hosp.	Parietal and omental.	R. Clamp and L. Ligat.	25 lbs	Short.	.....	"	Septicæmia	My first operation under the spray, and my last with the clamp
5	Dr. H. Y. Evans, Philadelphia.	50 W.		2	1	Mar. 1, 1878.	Home.	Universal.	R. Ligat. and L. Ligat.	Malignant polycyst.	Long	Glass tube.	"	Peritonitis	No antiseptic precautions; abdominal wall very fat; the ligature ends were brought out of wound.
6	Dr. H. H. Mitchell, Elkton, Md.	76 M.		6	2	Sept. 2, 1878.	Home.	Parietal and vesical.	L. Ligat.	Polycyst.	Short.	.....	"	Exhaustion	No antiseptic precautions. In this case and in all the following ones the ligatures were cut close to the knot.
7	Dr. B. F. Baer, Philadelphia.	53 S.	...	...	...	Oct. 27.	Hosp	Extensive parietal.	R.....	Do	Long.	.....	"	Peritonitis	Spray used in this case and in all the succeeding ones.

8	Dr. J. E. Bauman, Telford, Pa.	44 W.	6	May 31, 1879.	Home.	Parietal and omental.	L.....	46 lbs. Colloid.	Long.	.....	Recov.....	Cyst had to be emptied by scooping out contents with the hand.
9	Dr. R. Horner, Gettysburgh, Pa.	55 S.	...	1 June 15.	Hosp.	Extensive parietal, omental.	L.....	35 lbs.	"	Glass tube.	"	
10	Dr. L. J. Deal, Philadelphia.	40 M.	4	1 June 26.	Home.	Universal	R.....	Purulent polycyst.	"	"	Death	A forlorn hope—already in extremis from septicaemia caused by the old-fashioned tapping.
11	Dr. Jacob Roberts, Philadelphia.	40 M.	...	1 Sept. 21.	"	Parietal and omental.	R.....	71 lbs.	"	.....	Recov.....	
12	Dr. B. F. Baer, Philadelphia.	46 W.	7	2 Oct. 26.	Hosp.	Parietal and omental.	R.....	40 lbs.	"	Glass tube.	"	
13	Dr. E. Dawson, Frederica, Del.	35 M.	2	Dec. 7.	"	None	L.....	Large colloid.	Short.	...	"	Malignant colloid; the cyst had burst before the operation. She recovered, but died shortly after returning home.
14	Dr. R. A. Clee-man, Philadelphia.	45 M.	3	1 Dec. 28.	Home.	"	R.....	Large polycyst.	Long.	.....	"
15	Dr. Emil Fischer, Philadelphia.	52 M.	6	1 May 2, 1880.	"	Parietal and intestinal	R.....	Solid polycyst.	"	.....	Death	A peritonitis and hemorrhage had been caused by the aspiration.
16	Dr. W. Goodell.	47 M.	1	May 9.	Hosp.	Universal	R.....	75 lbs. colloid.	"	.....	"	Mulatto. The cyst had burst before the operation; a formidable operation.
17	Dr. D. O. Crouch, Curwensville, Pa.	59 M.	...	Sept. 6.	Private Hosp.	"	R.....	Malignant polycyst.	"	.....	"	A very formidable operation; drainage-tube ought to have been used.
18	Dr. L. L. Sharp, Medford, N. J.	35 M.	2	1 Sept. 11.	Home.	Extensive omental.	R.....	Large	Short.	.....	Recov.....	

NO.	NAME OF PREVIOUS MEDICAL ATTENDANT.	AGE.	CONDITION.	NUMBER OF CHILDREN.	PREVIOUS TAPINGS.	DATE OF OPERATION.	PLACE OF OPERATION.	ADHESIONS.	SIDE & TREATMENT OF PEDICLE.	SIZE AND NATURE OF TUMOR.	LENGTH OF INCISION.	DRAINAGE.	RESULT.	CAUSE OF DEATH.	REMARKS.
19	Dr. J. K. Kane, Wilmington, Del.	34 S.		...	1	Sept. 16.	Home.	Covered by broad ligament and omental parietal.	R..... L.....	Large	Short.	Glass tube.	Death	Shock	Both ovaries were evidently imbedded in the tumor, which was removed by enucleation. A very long incision was here needed on account of the solid nature of tumor.
20	Dr. H. Kratz, Hilltown, Pa.	50 M.		4	Sept. 25.	"	"	Universal parietal.	L.....	30 lbs. Semi-solid polycyst.	Long.		Recov.		Over twenty ligatures needed. She recovered from operation, but died seven weeks later from a malignant growth of liver.
21	Dr. L. D. Harlow, Philadelphia.	67 S.		...	3	Nov. 28.	"	Omental and uterine, omental and pelvic.	L.....	10 lbs. oligo-cyst.	Short.	Glass tube.	"		Patient already in extremis from septicæmia; contents of cyst abnormally offensive. Both ovaries were involved in the tumor and removed.
22	Dr. N. J. Cooper, Stockton, N.	49 M.		5	Dec. 4.	"	"	Omental and uterine, omental and pelvic.	L.....	20 lbs. cyst.	"		"		
23	Dr. T. J. Birch, Port Carbon, Pa.	29 M.		3	Dec. 5.	Hosp.	"	Universal.	L.....	Purulent cyst of parovarium	Long.	Glass tube.	Death	Exhaustion	
24	Dr. A. Macey, Camden, N. J.	45 M.		...	7	Dec. 9.	Home.								

25	Dr. H. P. Van Valzah, Clearfield, Pa.	54 M.	4	...	Dec. 11.	Home.	Exten've parietal.	L.....	Large oligo-cyst.	Short.	.....	Recov	
26	Dr. L. G. Bauer, Philadelphia.	47 M.	3	10	Dec. 18.	"	Omental.	L..... R.....	Small polycysts.	Short.	.....	"	Both ovaries and one parovarian cyst were removed.
27	Dr. Smith Fuller, Uniontown, Pa.	35 M.	.....	.....	Jan. 22, 1881.	"	Omental, parietal, and intestinal	L.....	Large solid cyst.	Short.	.....	Death	The tumor was malignant, and had to be enucleated out of broad ligament to get a pedicle.
28	Dr. J. H. Chandler, Centreville, Del.	43 M.	2	1	Jan. 29.	Private Hosp	Omental	L..... R.....	Medi-um.	Short.	.....	Recov	
29	Dr. A. Y. Coleman, Limerick Square, Pa.	44 M.	.....	2	Feb. 19.	Home.	Omental and pelvic.	R.....	Large polycyst.	Short.	.....	"	There was much ascitic fluid, and the womb was much enlarged by multiple fibroids.
30	Dr. W. D. McGowan, Ligonier, Pa.	27 M.	3	1	Feb. 21.	Hosp...	None.	L..... R.....	Small polycysts.	Short.	.....	"	Had been bed-ridden for two years; is now well.
31	Dr. Wharton Sinkler, Phila.	22 S.	.....	.....	Mar. 2.	Private Hosp.	"	L..... R.....	Small	Short.	.....	"	Cyst of each ovary, and also of left parovarium.
32	Dr. L. D. Harlow, Philadelphia.	30 S.	.....	1	Mar. 9.	Home.	Omental and parietal.	L..... R.....	Large polycyst.	Short.	.....	Death	Septicemia
33	Dr. S. Weir Mitchell, Philadelphia.	24 S.	.....	1	Mar. 23.	Private Hosp.	Pelvic and omental.	L..... R.....	Oligo-cyst.	Short.	.....	Recov	from septicaemia at the time of the operation.
34	Dr. G. S. Gardner, Ardmore, Pa.	60 M.	5	...	Mar. 29.	Hosp...	Omental.	L.....	Large mono-cyst.	Short.	.....	"	The right ovary had to be enucleated.
35	Dr. F. C. Shepard, Philadelphia.	40 M.	2	1	Apr. 5.	"	Omental and parietal.	R..... L.....	Large colloid.	Short.	.....	"	The cyst had burst some time before the operation. I tapped once, but got no fluid.

NO.	NAME OF PRE- SENTING MEDICAL ATTENDANT.	AGE.	CONDITION.	NUMBER OF CHILDREN.	PREVIOUS TAPPINGS.	DATE OF OPERATION.	PLACE OF OPERATION.	ADHESIONS.	SIDE & TREAT- MENT OF PED- ICLE.	SIZE AND NA- TURE OF TU- MOR.	LENGTH OF INCISION.	DRAINAGE.	RESULT.	CAUSE OF DEATH.	REMARKS.
36	Dr. J. R. Clarendon, Cottville, Del.	40 M.		...	...	Apr. 20	Private	None.	L.....	Col- loid.	Short.	.....	Recov		
37	Dr. G. M. Mayes, Philadelphia.	34 M.		...	2	Apr. 21.	Hosp. Home.	Universal	R..... R.....	Pur- ulent.	Long.	Glass tube.	Death	Ex- haust	A desperate case, in which a pelvic abscess had occurred, opening into the bowel, and matting the cyst to the in- testines. For several days after the operation, feces escaped through the drain- age-tube.
38	Drs. D. Hayes, Agnew and W. Goodell.	14 M.		2	1	May 10.	"	Intestinal	R.....	Large	Short.	.....	Recov		
39	Dr. G. K. Mescher, Worcester, Pa.	49 M.		9		May 14.	"	Parietal	L.....	Large poly- cyst.	"	.....	"	
40	Dr. F. Swartz, Lancaster, Doylestown, Pa.	32 M.		...	...	May 17.	Private Hosp.	Parietal and intestinal	L.....	poly- cyst.	Long.	.....	"	
41	Dr. A. Schaeffer, Lewistown, Pa.	38 S.		...	...	May 21.	Hosp. Home.	Universal	R..... L.....	Solid cysts.	Long.	.....	Death	Shock	A forlorn hope, bed-ridden for months, and reduced to extreme emaciation. She died on the table.
42	Dr. T. R. Hayes, Bellefonte, Pa.	45 M.		7	3	June 2.	Hosp.	Omental, parietal, and intestinal	L.....	Solid col- loid.	Long.	.....	Recov		Although the tumor was pronounced a round-celled sarcoma, the woman is doing well.

43	Dr. E. L. Duor, Philadelphia.	28 S.	1	June	2	Hosp.	Exten've parietal.	L.	Large oligo- cyst.	Long.	Recov	
44	Dr. J. Pittman, Tarboro, N. C.	50 S.	...	June	7.	Private Hosp.	Broad ligament	L.	Large uniloc ular.	Short.	.....	Cyst lay between the layers of broad ligament, and had to be enucleated. Two uterine fibroids were also removed.
45	Dr. John Fay, Altoona, Pa.	61 M.	8	1 June	18.	Home.	Omental, parietal, pelvic.	R.	Large	Short.	.....	"
46	Dr. T. V. Cran- dall, Phila.	62 W.	...	Sept.	5.	Private Hosp.	None	R.	25 lbs	Short.	.....	"
47	Dr. J. Hearn, Philadelphia.	29 M.	2	Oct.	9.	Do.	Omental.	L. R.	Solid fibroid 18 lbs.	Very long.	.....	"
48	Dr. J. R. Haney, Camden, N. J.	50 M.	3	1 Oct.	20.	Hosp	Exten've parietal.	R.	Poly- cyst; 65 lbs.	Short.	Glass tube.	Recov
49	Dr. R. W. Deaver, Germant'n, Pa.	37 M.	5	Oct.	22	Home.	Parietal.	L.	Col- loid	"	.....	"
50	Dr. E. W. Wat- son, Phila.	50 W.	7	Oct.	24	"	Omental, parietal.	L.	20 lbs.	"	.....	One cyst was dermoid.
51	Dr. Geo P. Yost, Loganville, Pa.	35 M.	1	3 Oct.	29.	Hosp	Omental, parietal, pelvic, uterine.	R.	30 lbs.	"	Glass tube.	Ex- haust
52	Dr. Lloyd, Yard leyville, Pa.	35 W.	2	Nov.	5.	Home.	None	R.	15 lbs.	"	.....	Recov
53	Dr. Howard Kel- ley, Phila.	40 S.	...	Nov.	7.	Hosp.	Omental and parietal.	L. L.	35 lbs.	Long.	Glass tube.	"
54	Dr. W. C. Simp- son, New Brigh- ton, Pa.	54 M.	8	Nov.	12.	Home.	None	R.	3 lbs. Solid fibroid	Short.	.....	"
												Two large pedunculated ute- rine fibroids were also re- moved Solid fibroid of right ovary, with ascites.

No.	NAME OF PHYSICIAN AND MEDICAL ATTENDANT.	AGE.	CONDITION.	NUMBER OF CHILDREN.	PREVIOUS TAPPINGS.	DATE OF OPERATION.	PLACE OF OPERATION.	ADHESIONS.	SIZE & TREATMENT OF PEDICLE.	SIZE AND NATURE OF TUMOR.	LENGTH OF INCISION.	DRAINAGE.	RESULT.	CAUSE OF DEATH.	REMARKS.
55	Dr. T. D. Dunn, Philadelphia.	36 M.		2	1	Nov. 14.	Hosp.	None.	R..... L.....	10 lbs. Colloid.	Short.	.....	Recov.		
56	Dr. W. Goodell.	27 M.		...	...	Nov. 17.	"	Pelvic, omental, intestinal, and uterine.	L..... R.....	20 lbs.	Short.	Glass-tube.	Death.	Shock	A very difficult operation; both ovaries and the womb were glued together in one mass, and had to be separated.
57	Dr. W. Goodell.	32 M.		3	...	Nov. 25.	"	Very extensive partial.	L.....	Poly-cyst. 45 lbs.	Long.	"	"	Septic peritonitis	Two cases of erysipelas were in the building at the time of the operation.
58	Dr. B. F. Baer, Philadelphia.	20 S.		...	1	Dec. 8.	"	None	L..... R.....	15 lbs. Colloid.	Long.	.....	Recov.		
59	Dr. W. C. Dixon, Phila.	36 M.		2	...	Dec. 17.	"	Intestinal, pelvic, uterine.	R..... L.....	20 lbs.	"	.....	"	.....	Each ovary so incorporated with the womb that the latter organ was also removed.
60	Dr. M. H. Green, Phila.	40 S.		...	...	Dec. 31.	Private Hosp.	Intestinal.	L.....	15 lbs.	Short.	.....	"	.....	Cyst of parovarium, with corresponding ovary flattened in its wall.
61	Dr. R. P. Harris, Phila.	50 M.		1	...	Jan. 10, 1882	Home.	Slight omental.	L.....	30 lbs. c'lloid.	Long.	.....	"	.....	Semi-solid colloid cyst.

In the foregoing tables, the weight of the cyst and of its contents have often been guessed at. The letters S, M., and W. denotes respectively single, married, and widow. The letters R. and L. mean the right and left ovary, and the letter which precedes indicates the larger cyst.

My next paper will contain statistics of Drs. Peaslee, W. L. Atlee, Nathan Bozeman, Pallen, Drysdale, Storer, and of other practitioners whose reports have not been received in time for this communication. I shall then give a final analysis of all the cases, together with their results, and shall briefly discuss the question of Listerism. I shall also quote opinions of all leading ovariologists as to preliminary treatment, and the arrangements to be made prior to the operation by the assistants.

(Concluded in the next number.)

THREE CASES OF RUPTURE OF THE UTERUS.

BY

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In the April number (1881) of the *AMERICAN JOURNAL OF OBSTETRICS*, Dr. R. P. M. Ames gives a valuable paper on ruptured uterus, and presents tabulated statistics of a hundred cases. According to Ames' table, the 100 cases of rent uteri represent really 100 patients with 63 deaths, 31 recoveries, 6 results not stated, and 103 cases of ruptured uteri; adding our cases of ruptured uterus—reported in detail further on—there are 103 patients with 108 ruptured uteri, viz.: one of Ames' cases four times successively, and two cases of ours each twice at term. Thus we have the following results:

1. 103 patients with 32 recoveries = 31 %
 65 deaths = 63.1%
 6 not stated = 5.8%
2. 108 cases of ruptured uteri with 36 recoveries = 33.3%
 66 deaths = 61.1%
 and 6 result not stated = 5.6%

These 103 patients, representing 108 cases of uterine rupture, present 110 children (Barnes, triplets) of whom 90 succumbed before delivery = 82%; six are reported as living = 5.4%; results not stated 14 = 12.7%.

We may assume then that about one-third of the mothers may recover from rupture of the uterus—one in three—and about nine out of ten children succumb before delivery. In

fact, a child can be rescued from certain death only by immediate energetic interference.

The cases presented in the following lines have not been embodied into any statistical report, nor have they been or are now accessible to the general reader. I have prepared them from Society abstracts and from detailed accounts received from the gentlemen whose names appear in connection with their cases.

I. Rupture of uterus in two labors; complete recovery after the first accident; rupture through left wall of cervix and body, and death shortly after the second; rupture probably at same spot. Dr. S. L. Marston.

The doctor was called, September 14th, 1872, at 8 o'clock in the evening, to attend Mrs. K., æt. 26, vigorous, in her sixth confinement; the midwife in attendance stating that the waters escaped eight hours previously, and that the patient has been in active labor since then, but the presenting part was not advancing. A digital examination revealed a rigid os, firm and wiry to the touch and but partially dilated, the head presenting and apparently entering the superior strait in the left anterior occipito-iliac position.

The first pain witnessed was a strong irregular uterine contraction, during which the patient experienced more than ordinary suffering, complaining of a cramp-like pain behind the pubic arch. To relax the os and secure more regular and uniform contractions, a half-grain of morphia with an eighth grain of tartarized antimony was exhibited. The interval of repose was short, not exceeding three minutes, when another forcible but irregular contraction followed. Its onset was sudden and violent, and the patient became almost uncontrollable; when at its acme she made an effort to turn on her left side, at the same time grasping the lower portion of her abdomen, and exclaiming, "something has given way within me." This proved to be a terrible reality—the uterus had yielded to the excessive non-co-ordinating force, and the patient was in danger of having the uterine contents discharged into the peritoneal cavity. The parts presenting had receded and slight hemorrhage set in.

Without delay the hand was passed into the uterus to bring down the feet; the head had escaped through the rent into the left iliac fossa. The inferior extremities were easily secured and brought down. Considerable traction was required to turn and to bring the body of the child through the pelvis, which was, however, accomplished by the aid of broad tapes, clove-hitched around the ankles. After delivering the body, the head still remained above the pubes, not having returned through the rent, the face looking to the front of the mother's abdomen. The uterus had contracted down so far that it became impracticable to deliver the head through the rent. The fetal heart having ceased

beating, the head was brought within easy reach by manipulation, and the operation completed with the perforator and crotchet.

After delivering the placenta, a large portion of omentum passed through the rent and extruded beyond the vulva. The mass was carefully washed with tepid water and returned into the abdomen; the vagina was loosely tamponed with soft rags to prevent recurrence of the accident.

Shock was not excessive; pulse weak, 130; there was neither syncope nor vomiting, and the patient claimed to be free from pain and comfortable. She was placed on an even mattress, and the foot end of the bed elevated six inches. A broad bandage secured the abdomen, and a half grain of morphia was ordered every two hours.

Twelve hours later she slept quietly: pulse 120; bowels tympanitic, but free from pain on moderate pressure. The tampon was removed, and the vagina washed out with tepid water. Hot cloths dipped in chamomile tea were applied to the abdomen under the bandage. Morphia, $\frac{1}{4}$ grain p. r. n., iced tea, and gruel water to allay thirst.

After twelve hours, the omentum again protruded four inches beyond the vulva. There was no change in the patient's general condition. Treatment continued, and the extruded omental mass was constantly poulticed with tepid water. Quinine and stimulants were ordered; the bowels moved by occasional enema, and absolute rest in the recumbent position was strictly carried out.

There was no proper lochial flow established, but on the fourth day, a semi-purulent, slightly fetid discharge appeared, which continued for six weeks. Coincident with this flow, the extruded omental mass slowly suppurated and disappeared from view in five weeks. At this time the patient left her bed. In six weeks from date of confinement she resumed her domestic duties.

Two months later, a specular examination revealed a fissure, one-fourth inch wide, extending obliquely through the anterior lip of the os, a little to the left of the median line, filled with granulations which bled easily when touched with the probe. Eleven months after confinement, there was only an ordinary cicatrix.

Twelve months later, she became pregnant the seventh time, and aborted at the fourth month. Two months after this, her eighth pregnancy began; premature labor set in at the sixth month, the child surviving but a few minutes. Two months after this premature labor, her ninth pregnancy commenced, and went to term, being confined September 3d, 1875.

Labor progressed favorably for four hours, when the contraction suddenly ceased, and hemorrhage commenced. There was great prostration, altered features; accelerated respiration, small, quick pulse. A vaginal examination revealed that the cervix had disappeared, and the head above the pubes outside of the uterine cavity. Administered an ounce of brandy, and delivered by podalic version. Turning was easily accomplished; the placenta was found detached and delivered with the feet. The child,

a male, weighing eight and three-quarter pounds, was dead. Morphia, brandy, and beef extract were freely administered, and external warmth applied; but vomiting of dark-colored fluid, like coffee-grounds, soon set in, and everything administered was rejected. Brandy and beef extract enema were given, and morphia injected hypodermically. Notwithstanding all treatment, she died twenty-four hours later. Autopsy not allowed. The second rupture was in the old cicatrix.

CASE II.—*Transverse rupture at junction of body and cervix—Death in seven days. Dr. Ira Manley.*

Mrs. D., German, aged forty—previous labors protracted and severe—was confined the eighth time Sunday, November 14th, 1875; a midwife in attendance. Pains regular and severe. On Tuesday noon (16th), without noticeable additional pains or suffering, the waters were discharged, followed by a slight hemorrhage. From this time labor pains ceased. Becoming alarmed, a physician was called. He remained with her that and the following night. Dr. Manley was called Thursday, 18th, without knowledge or consent of the attending physician. Dr. M. called on the latter and was told “that nothing presented; that the midwife claimed the head rested on the perineum, and that the membranes were ruptured; and that he could not make anything of the case.” He also refused to continue his attendance.

The patient was somewhat pinched, pulse 100; there was no marked abdominal tenderness or pain. The os was very high up, almost beyond reach, the lips pouting, and the cervix undilated. The posterior *cul-de-sac* appeared to be a confused pulpy mass. Ruptured uterus was not suspected, as the usual grave symptoms were absent; sudden excruciating pain, suspension of labor pains, hemorrhage, recession of the presenting parts, vomiting were conspicuous for their absence, and an undilated os and cervix seemingly invalidated the testimony of rupture of the uterus.

The hand was introduced into the vagina, and the parts were carefully explored; the os was firmly closed; the cervix a solid mass; the fetus was in the uterine cavity. There was a transverse rent at the cervico-corporeal junction, implicating the vagina, about four inches in length. Passing the hand through the rent into the abdominal cavity, the fetal head was found in the left iliac fossa. The abdominal aorta pulsated between the fingers, and the hand felt the promontory of the sacrum and several lumbar vertebrae.

The husband and friends were informed of the patient's condition and of the probably fatal result. Weighing all chances carefully and considering the length of time passed since the accident occurred, the decision was to deliver; but how? Counsel was at a distance, the instruments twelve miles away, and there was no time to lose. Gastrotomy would inflict another serious injury, and was out of the question. If, on the other hand, delivery were attempted *per vias naturales*, great difficulty would be encountered in bringing the fetus through the rent, with

a solid cervix impeding the progress below, perhaps adding additional injury. Dilatation was useless, and craniotomy of the head beyond reach impracticable.

Great difficulty was encountered by the high position of the head. Finally, the feet were brought down, and delivery completed. The uterus contracted. Anesthetics were not used, but the patient took occasional doses of whiskey, and, at the close of the operation, which lasted three hours, she did not appear greatly exhausted. After the usual attentions, she expressed herself as feeling quite comfortable.

November 19th, 3 P.M.—T., 100; P., 100; bowels moved spontaneously. Patient expressed herself as feeling better than usual so soon after delivery. Opium and general supporting treatment. 20th, patient impatient to sit up. Living twelve miles away, she was not visited on the 21st, and on the 22d she was cheerful. There was no pain nor especial tenderness. Very anxious to sit up; P., 100; T., 103. 23d, 3 A.M., sinking, died at 9 A.M.; no autopsy.

In a letter recently received, the doctor further states that "he cannot say whether the rupture of the vagina was transverse. Perhaps I ought to mention that the right iliac crest was about one and a half inches higher than the left. The pelvic axis had an obliquity to the right. She had been delivered once instrumentally, but whether by forceps or embryotomy I did not learn. My hand passed through the rent with the greatest ease. Of course, the advice of authors to dilate the os and cervix was impracticable in this case. The patient's condition was an unusual one."

CASE III.—*Longitudinal rupture of cervix and body in two successive labors; recovery.* Dr. D. W. Moore.

The doctor was called September 8th, 1875, at half-past one o'clock in the morning to attend Mrs. E. G. in her fourth labor. Her previous accouchements had been normal, and, except the first, short. An hour after his arrival, the membranes were ruptured, and labor progressed satisfactorily until half-past five o'clock. The head was then well engaged in the inferior (?) strait. She suddenly gave a sharp cry, and complained of "tearing and smarting" above and behind the pubis; this was the last contraction. A tumor of the size of a child's head at term, easily movable from side to side, and causing severe pain was now observed about four inches above the pubic arch in the median line.

The patient at once vomited freely, and her face and lips became livid, followed by profuse perspiration. The pulse was scarcely perceptible—a mere flutter.

Dr. B. being sent for, arrived in a few minutes, and "confirming my diagnosis of ruptured uterus, we decided to remove the child at once." The urine was drawn off by catheter; stimulants were administered. Forceps were easily introduced, and a large dead child delivered. The hemorrhage following delivery of the placenta was not excessive. After delivery, the patient

rallied; her pulse became stronger. Full doses of morphia were ordered in wine every two hours.

At 12 M., pulse 110, vomiting persists, dull pain in the uterus. Hot arnica stupes were continuously applied to the abdomen. 8 P.M., same.—9th, 8 A.M., vomiting ceased at three o'clock this morning; pulse 100, no pain. 12 M., pulse 120; tympanites. 7 P.M., pulse 100; more cheerful; hungry.—10th, 9 A.M., pulse 90; no material change since last evening. 12 M., tympanites subsiding; patient requested her attendants to tighten the bandage several times. 7 P.M., pulse 95.—12th, 8.30 A.M., pulse 100; bowels moved twice. Has pains on right side, which she calls neuralgia.

The subsequent history is unimportant; suffice it to say she made a good recovery.

Five years later, she became pregnant again, and was confined (5th) September 23d, 1880, labor progressing favorably until the commencement of the second stage, when she suddenly exclaimed "there it goes!" There was a rigor, shock, cessation of contraction. With Dr. B.'s assistance, the child was delivered at once. The placenta was removed; a loop of intestine appeared at the vulva. The gut was restored to the abdomen, and several clots of blood were removed from the peritoneal cavity.

The patient was placed in bed with shoulders elevated to facilitate drainage. The uterus contracted nicely. Full doses of morphia were given p. r. n. through the night.

Sept. 24th.—11.40 A.M., P., 96; T., 102.5°; tympanites. 8.20 P.M., P., 98; T., 103.5°; nausea, probably from drinking too much water.—25th, 4.30 A.M., P., 92; T., 101.5°. 5 P.M., P., 100; T., 102°; restless, hiccough, tympany increasing.—26th, 8.40 A.M., P., 94; T., 101.2°. 6 P.M., P., 94; T., 101.8°; vomited several times through the day.—27th, 7.45 A.M., P., 102; T., 102°; persistent vomiting, severe pain in right side. 6 P.M., P., 104; T., 102.5°; occasionally vomiting stercoraceous matter.—28th, 8 A.M., P., 104; T., 102.5°; vomiting checked since nine o'clock last evening, tympanites decreasing, more hopeful. 7.30 P.M., P., 95; no pain, tympanites subsiding; ordered enema.—29th, 9 A.M., P., 96. 6 P.M., P., 100; bowels moved; patient apparently improving.—30th, spontaneous motion of bowels. Appetite.

In the latter part of October, the patient walked two blocks to witness a torchlight procession.

In a letter of June 16th, 1881, the doctor adds the following particulars: "The first rent was about four inches long on the posterior uterine wall, involving the cervix and extending an inch or more into the vagina. The second rupture occurred through the first (old) cicatrix. I have proposed an examination to discover the site of rupture, but the patient is very modest, and her husband is in Colorado. She refused, but stated that she suffered pain in the region of the injury when stooping, and tired easily while attending to her household duties. I cannot say what is the exact site of injury, nor what part it may play in the causation of pain or weakness, unless she should at some future time

consent to an examination. She took one-half grain morphia every three hours for two weeks."

Remarks.—One of our cases died seven days after the injury. One made an extremely rapid recovery the first time, and was restored to fair health after the second laceration, and one recovered in five weeks from the first accident, and died within twenty-four hours after the second accident. All the children succumbed.

Some of the symptoms of ruptured uterus were present both times in Marston's case, but more marked the second time. Moore's case was severely prostrated both times and recovered, although stercoraceous vomiting set in. Manley's case presented but few of the usual symptoms of laceration of the uterus, and apparently clung tenaciously to life, but sank very quickly. This case might have been saved by early interference. I doubt that either Cesarean section or gastrotomy would have averted the fatal issue.

In Marston's case, the elevation of the foot end of the bed did not hinder the omental mass from again protruding; in fact the tampon was the only factor to keep the mass up, when the tampon was removed the extrusion was worse than before, and the patient recovered in spite of the sloughing process which, by its protraction, invited septic infection. In Moore's case, the elevation of the upper extremities and trunk had no effect in causing the gut to descend after being once replaced; but in view of stercoraceous vomiting it is possible that the bowel was either twisted upon itself, or caught in the laceration and held there, for a time at least, by the contracted uterus. The quantity of morphia taken in two weeks—56 grains = $\frac{1}{2}$ grain every three hours—is worthy of remark, as no toxic symptoms developed.

It is evident that the cicatrix of one laceration becomes a weak point, a focus for laceration in subsequent pregnancy and labor; cicatricial tissue interfering with the proper dilatation of the os and cervix. Therefore if the child be large, deformed, or malposed; or the mother's pelvis be deformed, or the cavity of the pelvis decreased by exostoses, tumors, a loaded rectum; amniotic dropsy; degenerated uterine muscular tissue, very thin uterine walls, either by excessive stretching during labor or by other causes; occlusion of the os uteri, placenta previa; excessive use of ecbolics; or irregular and severe or prolonged and

excessive labor pains with an undilated or undilatable os, or a firm, wiry cervix, would be sufficient cause or causes to produce laceration through or near the old cicatrix, and may even cause a rupture in a sound uterus during labor.

Conclusions.—1st. Sudden sharp pain, cessation of uterine contractions, recession of the presenting parts, hemorrhage, shock, collapse or syncope, rigors, vomiting, may be marked, moderate, or apparently absent in different parturient patients suffering from laceration of the uterus. The temperament of the patient is entitled to certain influence in this accident. All the symptoms enumerated are not necessarily present in each individual case.

2d. When any parts of the abdominal viscera insinuate through the rent and protrude into the vagina or, beyond the vulva, the patient's chances are decreased, as this new complication invites septic infection; and if the intestinal tube is caught and held in the laceration or becomes twisted upon itself, intestinal obstruction may become a grave factor in the case.

3d. If the fetus is wholly or in part in the uterine cavity, and the os is dilated or dilatable, delivery should be rapidly accomplished by the usual procedure. If the fetus have escaped partly (or altogether) into the peritoneal cavity, and the uterine os is not sufficiently dilated for manipulation, *gastrotomy should be performed without delay, for the benefit of the mother*; possibly the child may be saved. Cesarean section would in such a case be useless, even harmful.

4th. Podalic version should be performed, if possible, to seize the lower extremities; destruction of the child in utero or in the abdominal cavity is a difficult operation, and dangerous to the mother; when turning is impossible, and the forceps cannot be used, gastrotomy should be performed at once if the child have escaped into the abdominal cavity.

5th. Whether anesthetics do not counterbalance the benefits obtained during delivery by their depressing after-effects is as yet an open question.

6th. Rupture of the uterus is a grave lesion, but not necessarily fatal to the mother; but the accident is liable to recur in subsequent pregnancy and labor. Ruptured uterus is almost invariably fatal to the child; immediate delivery is necessary for the preservation of the child's life.

7th. Since certain cases are reported "not given" or "results

not stated," we are justified in classing such doubtful cases as deaths; mortality rates: mothers recovered 33.3%, deaths 66.6%; children living 5.4%, dead 94.5%.

296 W. WATER STREET, MILWAUKEE.

MICROSCOPICAL STUDIES ON THE CATAMENIAL DECIDUA.

BY

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(With two woodcuts.)

At the present time, it is agreed by all histologists that no new-formation of a tissue can take place except through embryonal elements. Morbid as well as normal tissues develop from an original indifferent or medullary formation, which is known to constitute the body of the animal embryo in the earliest stages of its existence.

Whenever one tissue is about to be transformed into another, the original one first breaks down into medullary elements, that is, it falls back into the earliest stage of embryonal development, from which a new tissue may arise.

The same process invariably takes place when, from an originally normal tissue a new formation starts. This new formation may be inflammatory in its nature, and, as such, limited in its course; or it may be a new formation without typical termination, a so-called neoplasm or tumor—it makes no difference, the process is the same.

The peculiar condition which sometimes occurs at the menstrual period, producing membranous discharges, called "*decidua catamenialis*," or "*dysmenorrhea membranacea*," is known to be a new formation from the mucous membrane of either the uterus or vagina, or both. This process is independent of pregnancy. It is observed only at the time of menstruation, and is unquestionably caused by an irritation of the mucosa of the genital tract. This irritation is a constituent part of normal menstruation, and, as well-observed cases show, the

only process which takes place whenever both ovaries are absent. This irritation must reach a higher degree than in normal menstruation, in order to produce a menstrual decidual.

My purpose in the following pages is to present the anatomical features of uterine decidual membranes, while the clinical aspect will not be taken into consideration.

The materials for my studies were found in the laboratory of Dr. Heitzmann, of this city. They consisted of five specimens furnished to that laboratory by Drs. M. D. Mann, Paul F. Mundé, J. B. Hunter, R. Tauszky, and Mary H. Gilbert. These specimens had all been preserved in alcohol, and a few weeks before examination had been placed in a weak solution of chromic acid, about one-sixth per cent. After sufficient hardening, the specimens were imbedded in a mixture of wax and paraffin, and were cut into thin sections for microscopical examination.

Under the microscope, all the specimens proved to be composed of medullary corpuscles and a relatively small amount of basis-substance, the latter in its myxomatous and fibrous varieties. The fibrous exhibited both the reticular arrangement and that of bundles, composed of fine fusiform bodies in the earliest stage of development.

In all specimens glandular formations of a tubular nature were present, lined by columnar epithelia, very probably the remains of original utricular glands, and not newly formed.

Under a power of 500 diameters, the medullary corpuscles presented mostly a globular shape; the globules were somewhat flattened at their parts of contact. Scattered among the globular elements were oblong spindle-shaped formations, frequently arranged in clusters. All these bodies were invariably separated from each other either by very narrow rims or by fields of a slightly granular substance, which fields were about the size of an original medullary corpuscle. Clusters of such medullary corpuscles were irregularly traversed and bounded by slender bundles of fibrous tissue. The medullary corpuscles did not appear uniform. Some were about the size of red blood-discs, and almost without structure; others were rather larger and indistinctly granular; others again, the largest, showed a distinct granulation and a central nucleus. The relative proportion of these three varieties varied greatly in

the different specimens. In Dr. Tauszky's case, the shining homogeneous bodies were largely in excess. In another, Dr. Mann's case, the large, pale, granular bodies were most abundant, and the intervening spaces unusually broad. In a third case, that of Dr. Hunter, the small homogeneous bodies were scanty, while the pale granular corpuscles were numerous and about six times the size of the homogeneous ones. Their granulations were so coarse as to conceal the nucleus. The corpuscles exhibited a distinct arrangement in clusters, and between the clusters delicate fibrillæ could be traced, thus producing the appearance of myxomatous tissue. In a fourth specimen, Dr. Gilbert's, the smallest bodies were few in number, the large granular ones surpassed in size the smaller by six or eight diameters. In many of these larger bodies, the granulations were pale, evidently due to a formation of basis-substance, the nucleus very distinct, and the interstices had the appearance of a fibrous network resembling placental structure. The fifth case, that of Dr. Mundé, was so different from the others as to require a more detailed description.

High powers of the microscope (1,000 diameters) proved that this mass of embryonal corpuscles deserved the name of a tissue from the fact that all the bodies, of whatever size, were united by delicate filaments. No structure was defined in the smallest corpuscles. The larger ones showed vacuoles in their interior, while, in the largest, a reticulum could be traced whose points of intersection, with low powers, appeared to be granular. The reticulum was most marked in the finely granulated corpuscles with distinct nuclei, and the granulations within the nucleus also had the appearance of being connected in a net-like structure. The reticular formation crossing the protoplasmic bodies became continuous with all their neighbors through the delicate filaments traversing the light rims. The granular fields lying around these bodies exhibited only a faint reticulum, but still this was united with the medullary corpuscles by the points arising from their peripheries.

Wherever fibrillæ were found, either in bundles or as a reticulum inclosing single or grouped corpuscles, these fibres were invariably composed of minute spindle-like formations. These spindles showed a reticular structure, and were also joined to neighboring protoplasmic corpuscles by fine threads (see Fig. 1).

Evidently, in the decidua, we have stages of development which can be understood only through the researches of C. Heitzmann, the results of which were published in the "Transactions of the Vienna Academy of Sciences" for 1873. This writer claims that the primary form of living matter is always a shining homogeneous globule without visible structure. First, the globule takes in a certain amount of a liquid, then vacuoles with an inclosing frame of living matter are formed. Later, the living matter takes on a net-like appearance, and in the centre of the corpuscle a nucleus is seen, which is also a formation of living matter. After a time, the liquid contents of the meshes of the protoplasm become more or less solidified,

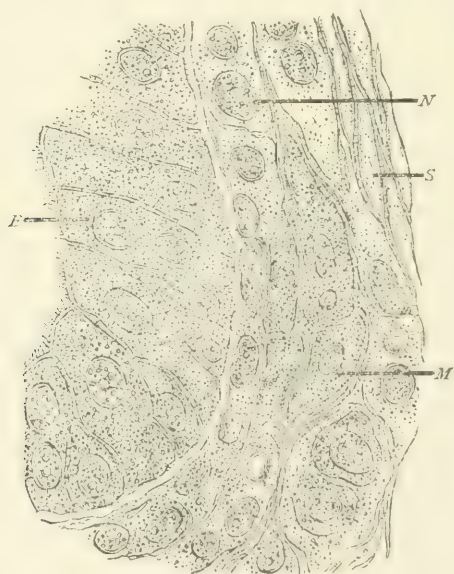


FIG. 1.—*Decidua catamenialis*.

M, Nucleated medullary corpuscles.

N, Such corpuscles transformed to basis-substance, the nuclei remaining unchanged.

S, The medullary corpuscles split into spindles.

E, Columnar ciliated epithelium of a utricular gland. Magnified 1,000 diam.

and represent basis-substance, in which we can still trace the living matter, although it is only faintly visible in the fresh specimen.

In the specimens of decidua studied by me, the smallest bodies represent the earliest stages of development of living matter, and from these globules arose the nucleated protoplas-

mic corpuscles, which were considerably enlarged from imbibition of a liquid. Here the living matter has passed into the reticular stage of development. In a more advanced condition, the protoplasm had been transformed into basis-substance which was either fibrous or myxomatous in character, and remained traversed by a reticulum of living matter. The light fields around the medullary elements were made up of a myxomatous basis-substance, and this substance composed the mass in which lay the unchanged central nuclei described in the fourth case.

Fibrous basis-substance may appear in the form of straight bundles inclosing myxomatous fields. It is obvious that in this condition the liquid contained in the original medullary corpuscles must have been transformed into a solid basis substance, while the living matter itself remained unchanged. Living matter in a reticular arrangement first crosses the liquid, and afterwards the interstitial solid basis-substance. The fibrous basis-substance is always composed of slender spindles, which indicate that the protoplasmic bodies had become elongated and divided up before a solidification of their liquid had taken place.

All specimens showed a varying amount of blood-vessels in longitudinal, transverse, and oblique sections. Capillary vessels were most abundant, being recognized as such by their flat endothelial lining. In one of the specimens, that of Dr. Tauszky's, scanty formations of vessels resembling arteries were observed. In Dr. Gilbert's case, arterial vessels were unmistakably present, characterized by the muscular coat. All stages of arterial development could be traced. In some parts there were only cord-like formations with parallel outlines, composed of small medullary corpuscles which flattened each other, rendering their shape polyhedral. The outer corpuscles, seen in front view, appeared fusiform, so as to encircle the cord. Transverse sections of such a formation in some instances exhibited medullary bodies arranged in a radiating manner, but without a clearly-marked calibre. In other parts, a central light space could be discerned, evidently the first trace of the future lumen. This opening must have been produced by the vacuolation of the most inner medullary bodies. Some cord-like formations which, if viewed trans-

versely, still appeared solid, when seen in longitudinal section, showed a narrow central calibre lined by delicate spindle-shaped bodies in lengthwise arrangement, corresponding to the endothelial coat of arteries (see Fig. 2).

In a more advanced stage of development, the artery had the appearance of a tube with a clearly-marked calibre; but in the opening there could be seen clusters of granules or nuclei, evidently the remnants of former vacuolated medullary corpuscles.

In addition to these, other bodies were noticed within the calibre, discoid in shape, homogeneous and somewhat pli-



FIG. 2.—New Formation of an Artery in Decidua Catamenialis.

D, decidua elements, at their periphery transformed to basis-substance, the nucleus unchanged; *S*, spindle-shaped corpuscles, indicating the formation of an adventitial coat; *A*, shining, homogeneous elements in longitudinal section, the forming smooth muscles; the endothelia visible in the depth. Magnified 1,000 diameters. (6)

ated, probably newly-formed red blood-corpuscles. In this stage of development, both the endothelial and muscular coat could be discerned in longitudinal and transverse sections of the vessels.

Of the existence of newly-formed veins there could be no doubt, and some of them were filled with blood. These vessels were composed of an inner endothelial and an outer fibrous coat, the latter made up of fine fusiform bodies in

longitudinal arrangement. Whether these formations could properly be considered smooth muscle-fibres, I am unable to decide.

In all the cases studied, there were more or less evidences of glandular formations of the tubular variety, either in the transverse or longitudinal section. Such tubules sometimes were folded up so as to give a branching appearance. Their inner layer always consisted of a single row of ciliated columnar epithelia (see Fig. 1).

In the peripheral parts of the tubules, where epithelia came in contact with connective tissue, numerous globular, nucleated corpuscles were seen packed between the fully-developed epithelia; evidently these were the beginnings of epithelial growth. In many places within the calibres of the glandular tubes, granular clusters were seen, undoubtedly the coagulated secretion of the glands.

I was unable to trace any further development of glandular formations or of epithelia; hence I concluded that most probably the tubular glands of decidua catamenialis were not newly formed, but only the remains of the original utricular glands.

The case furnished by Dr. Mundé was the fifth. He gave a history of a patient of his, a married lady, who menstruated only at intervals of three months, and who cast off decidual formations at every menstrual period. In microscopical examination of this case, it was seen that most of the medullary corpuscles were large and oval in shape. The fields of myxomatous basis-substance were abundant, and often holding in their midst coarsely granulated nuclei. The formation of a fibrous reticulum around the nucleated myxomatous fields and around the medullary corpuscles was more advanced than in any other case. In all sections obtained from these specimens, I met with fields of tissue, consisting either of medullary elements or fibrous connective tissue, in which a peculiar change had taken place, into a shining, homogeneous mass, such as has been described as waxy degeneration. Capillaries and veins were also abundant, the latter being frequently engorged with blood, but no arteries could positively be distinguished. These features are not fully analogous to those of decidua reflexa or vera, and from what I have observed,

I should conclude, therefore, that the case of Dr. Mundé was one of decidua catamenialis unusually far advanced in development, and almost approaching the features of decidua vera. A positive discrimination between decidua menstrualis and decidua vera, in their earliest stages of formation, seems to be a matter of impossibility, as they have features in common.

The development of fibrous connective tissue, as a rule, is farther advanced in decidua vera than in decidua catamenialis. Decidua vera, in its early stages, that is, up to the sixth or eighth week, is always characterized by the presence of a myxomatous structure uniformly distributed throughout the formation. Dr. J. W. Frankl has accurately described this reticulum. Its circular or oblong spaces contain either large, finely-granular protoplasmic bodies, with one or two nuclei, or a pale indistinctly granular myxomatous basis substance, in the centre of which often an unchanged nucleus is visible. Not infrequently in decidua vera we meet with multinuclear protoplasmic bodies, whose significance is shown by the above quoted author. Finally, decidua vera is marked by the presence of villousities which, running in all directions, are seen in longitudinal, transverse, and oblique sections. Originally the villousities were solid masses of living matter, and it is not till later that a differentiation takes place; on the periphery, flat epithelia are developed, and, in the centre, a delicate myxomatous tissue and vessels.

Literature.—According to H. Kundrat and G. J. Engelmann ("Untersuchungen über die Uterus Schleimhaut." *Wiener Mediz. Jahrbücher*, 1873), the hypertrophied mucosa of the uterus during menstruation overlaps the openings of the glands with a marked increase of the size of the latter. The condition of rest of the uterus during the period of reproduction is of but short duration, as the mucosa commences to swell slowly before the menstruation, and slowly returns to rest after it. No new formation of blood-vessels could be observed in the mucosa of the uterus, swelled and hypertrophied in menstruation, but a considerable opacity and fatty degeneration of the cells takes place. The surface epithelium is preserved to the time of the fatty metamorphosis, but when this ensues, the epithelium of the mucosa, as well as that of the glands, is cast off to a

considerable extent. In the first weeks of pregnancy, the mucosa, especially the interglandular tissue of the upper layers, develops to decidua, and the glands become elongated and enlarged.

G. Leopold ("Dysmenorrhœa Membranacea." *Archiv f. Gynäkologie*, 1876) draws attention to the difference between membranaceous formations from the uterus and those from the vagina. The former are covered by columnar epithelia, and contain the characteristic glands, while the latter show only flat epithelia. He believes membranous dysmenorrhea depends upon a diseased condition of the uterus, such as chronic metritis, fibrous tumors, or displacements. He says, the tissue between the tubular glands consists of small polyhedral or globular cells whose nuclei almost fill the bodies. Between these cells he found clusters of small, globular lymph-corpuscles. Evidently he does not consider these cells to be decidual formations. He also found a few waving arteries in the midst of the membrane and a great many capillaries close beneath the surface-epithelia, where the hemorrhagic clots are situated. He agrees with Beigel in terming this condition chronic endometritis and endocolpitis exfoliativa.

J. Hoggan and F. E. Hoggan, in an article entitled "Pathology and Therapy of Dysmenorrhea Membranacea" (*Archiv für Gynäkologie*, 1876), draw attention to the difference between membranes cast off from the uterus and those from the vagina. In the former, utricular glands were present and around them in a transparent matrix or intercellular substance, embryonal cells in different stages of development were noticed. These writers also call attention to the presence of embryonal tissue below the epithelia of the normal uterus, which they consider to be morphologically identical with that of true decidua, as well as that of the dysmenorrhœic membrane.

Wyder ("Beiträge zur normalen und patholog. Anatomie der menschl. Uterus-Schleimhaut." *Archiv f. Gynäkologie*, Bd. xiii.) asserts that in menstruation the superficial layers of the mucosa are cast off, whereas the deep layers remain intact. A distinguishing feature between decidua vera and menstrualis is, that in the latter the interglandular cells are small round cells almost completely filled by the nucleus, while in the former the nucleus, in comparison with the protoplasm, re-

mains small. He considers dysmenorrhea membranacea (1) as a fibrous coagulum, (2) as a mucosa altered by endometritis, and (3) as a decidua of pregnancy.

The results of my studies of the structure of decidual formations are the following :

1. Decidua menstrualis is formed by medullary or embryonal-corpuscles, exhibiting a gradual development from a shining globular, homogeneous mass of living matter into nucleated protoplasmic bodies.

2. Basis substance in decidua menstrualis is always scanty. It may appear either in the myxomatous or the fibrous varieties. In the former, it is slightly granular and apparently structureless; in the latter, it is either reticular or arranged in fibrous bundles. Both kinds of basis substance are formations springing from the original medullary corpuscles.

3. Decidua catamenialis is traversed by a large number of blood-vessels, mostly capillaries. In some cases, there is also a distinct new growth of arteries in such quantities as to greatly exceed the capillaries. Frequently, also, the formation of veins occur.

4. Decidua catamenialis always contains glands of the tubular variety, lined by columnar ciliated epithelia. Very probably these glands are not new formations, but simply the remains of the original utricular glands.

5. Decidua reflexa is composed of large medullary corpuscles, mostly of oval shape. The formation of a myxomatous and fibrous basis-substance is much farther advanced, and the amount of venous blood-vessels much greater than in decidua catamenialis.

6. Decidua vera is made up of a freely vascularized and fully developed myxomatous reticulum, in the meshes of which lie the nucleated decidual elements, or the myxomatous basis-substance holds the remnants of the decidual corpuscles. Fibrous connective tissue occurs mostly around the larger blood-vessels. Decidua vera is further characterized by the presence of villousities in different stages of development.

DIAGNOSIS OF OVARIAN CYSTS BY MEANS OF THE EXAMINATION OF THE CONTENTS.

BY

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New York.

(With Sixty-one Woodcuts.)

[Continued from page 49.]

7. *Cysts of the Broad Ligament.*

THE cysts of the broad ligament are of late often designated as parovarian cysts, but I think, from personal experience, Waldeyer is right when he points out that they are as often found far away from the parovarium as in the locality belonging to that organ.¹ I have seen small cysts in the most different parts of the broad ligament. The most common place is the hydatid of Morgagni and the fimbriæ of the tube, but they may be found anywhere, while the parovarium has quite a definite place, between the outer part of the tube and the hilus of the ovary. Waldeyer thinks that in any place parts of his so-called germinal epithelium (*Keimepithel*), which covers the Wolffian body and gives rise to the Fallopian tube, may be surrounded by connective tissue and form the germ of cysts of the broad ligament. The parovarium is the remnant of the sexual part of Wolff's body. Inside of this organ Waldeyer has found,² even in the full-grown woman, often extending quite up to the uterus, narrow canals filled with epithelial cells and granular cellular detritus. These canals are remnants of that other part of the Wolffian body which constitutes the primordial kidney. These too may doubtless become cystic, and be the seat of cysts of the broad ligament. I retain, therefore, this old name.

In no part of our subject do the text-books contain more errors than in regard to these cysts. Thus, in our most comprehensive American work on the diseases of the ovary, we

¹ Waldeyer: *Eierstock und Ei*, Leipzig, 1870, p. 128.

² *Ibidem*, p. 142.

read that cysts of the broad ligament are *always monocystic*, that *no albumen* is found in the fluid, and that its *specific gravity* is 1005.¹

First of all, we must arrive at a clear understanding about the definition of a cyst of the broad ligament, and, as here we inquire about the fluid, it would be to beg the question to argue from its characters. The diagnosis must be based exclusively on the relations and structure of the sac. Not every cyst found in the broad ligament is a cyst of the broad ligament, in our sense of the word. It is a well-known fact that ovarian cysts, instead of growing into the peritoneal cavity, may be developed between the layers of the broad ligament. In case xlv., when the abdominal cavity was opened, the right tube was seen stretched like a thin, hard string near up to the umbilicus, and the broad ligament was drawn up in front of the lower half of the tumor. It is not very rare to see the lower part of the tumor developed between the layers of the broad ligament, but I do not know if Thornton is correct when he states² that the ovarian and extraovarian unilocular cysts often occupy the same position, and may each have an ovary but little altered attached to them by some loose connective tissue and blood-vessels. Then I think it would be impossible to distinguish them, and I believe, therefore, that he has regarded as being unilocular ovarian cysts developed in the broad ligament what really were extraovarian cysts. When we find a tumor in the broad ligament and the ovary bound to it with, or, as I would say, separated from it by connective tissue and vessels, I do not see how we can escape the conclusion that it is an extraovarian cyst. There are only two ways in which we can tell a cyst of the broad ligament from an ovarian cyst; one is the fact that we find the ovary beside the tumor, and the other is, as I stated above, the character of the outer epithelium. A tumor covered with columnar epithelium is ovarian, and cannot be anything else, while the cyst of the broad ligament, being covered with peritoneum, has flat peritoneal endothelium. In cases of intraligamentous development of an ovarian cyst, the lower portion is covered by peritoneum, but the upper part has the columnar epithelium characteristic

¹ Peaslee, l. c., p. 153.

² Thornton, in *Med. Times and Gazette*, April 10th, 1875, p. 386.

for the ovary. Other anatomical signs are, indeed, of some value, but do not decide the question as to the nature of a tumor. Thus, as a rule, ovarian cysts have a mesosalpinx, while cysts of the broad ligament extend right up to the tube, which becomes imbedded in the wall. But we have seen above that these characters were present in a case of true ovarian monocyst (see p. 9). Commonly cysts of the broad ligament are unilocular, but they have been found with several compartments. Thus, Atlee found a small secondary cyst in the wall,¹ Spiegelberg² likewise. Lawson Tait³ describes a case in which the tumor was composed of five or six cysts. Thornton⁴ says that some specimens he examined, and one of which he showed to the Pathological Society, proved that we may have multiple and multilocular cysts of the broad ligament. Kiwisch⁵ also found several unilocular cysts, one beside the other. In a patient operated by Dr. Thomas for a multilocular ovarian cyst was found, on the other side, situated between the healthy ovary and the Fallopian tube, a parovarian tumor, composed of two compartments, each of the size of an English walnut, besides divers minute cysts in the neighborhood.

In the London *Lancet*, July, 1876, p. 114, is found an article on some laparotomies of Péan's. They are stated to be from notes translated by Wm. C. Rowlatt. The list comprises all laparotomies performed by Péan from the 20th of February, 1868, to the 31st of December, 1875, excepting those done with the object of removing tumors from the ovaries and the uterus. There are thirty-four operations, and among them no less than ten tumors are said to have been multilocular, besides those who were "areolar." This information is entirely misleading. By referring to the complete list⁶ of Péan's two hundred and ninety-nine laparotomies, performed between November 1st, 1864, and December 31st, 1877, I find confirmed by himself what I surmised, namely, that he calls any tumor extending into the broad ligament, a cyst of the broad ligament. There

¹ Schatz: Archiv für Gynækologie, 1876, ix., p. 142.

² *Ibid*, 1870, i., p. 485.

³ Tait, l. c., p. 222.

⁴ Med. Times and Gazette, April 10th, 1875.

⁵ Schatz, l. c.

⁶ Péan: Clinique chirurgicale, Vols. i., ii. Paris, 1876-1879.

may be said much in favor of this terminology, but the fact is, that all other writers I know of hitherto have used the term cyst of the broad ligament in a quite different sense, designating thereby a parovarian, or at least extraovarian cyst. It is evident, even from the short description accompanying each case in Péan's own list, that his cases were almost all what others more accurately have termed intraligamentous ovarian cysts.

The wall of cysts of the broad ligament is commonly thin, and formed of a single layer of dense connective tissue, bound with loose connective tissue to the peritoneal covering, and lined with a single layer of small, short, columnar, polygonal epithelial cells. It has very few blood-vessels, and is, consequently, of a whitish color. The inside is perfectly smooth, without villi or pouches. But all these characters were found in the above-mentioned case of true ovarian monocyst, the outer wall being so thin that it might have been taken for the thickened peritoneum. On the other hand, Spiegelberg¹ has given a careful description of a cyst of the broad ligament with quite different anatomical characters. It was two to four millimetres thick, and was composed of: first, a ciliated columnar epithelium, sending pouches down into the wall; second, a layer of connective tissue with many nuclei, a network of connective tissue with fine meshes, large blood-vessels with a thick muscular coat, bundles of muscular fibres, which especially accompanied the arteries; and third, a particular muscular layer. Besides, the fluid was like that of myxoid ovarian cysts. This description differs so entirely from all what is else known of cysts of the broad ligament that I cannot refrain from giving a slight doubt room in my mind, in spite of the testimony of such a good observer. He does not mention the distance between the tumor and the ovary. Is it quite sure that it was not an intraligamentous development of an ovarian cyst? Having myself found large masses of smooth muscular fibres in the wall of an ovarian cyst (case ix.), the presence of this element would not have the same weight with me as it evidently has had with Spiegelberg. But it is always a dangerous thing to think you know better than the man who operated the case, and described it most minutely. I have, therefore, also given an abstract of his observation in this connection.

¹ Spiegelberg: *Archiv für Gynäkologie*, 1870, Vol. i., p. 483.

Cysts of the broad ligament are much rarer than ovarian cysts. On my list of operative cases, I have only got three (cases v., xi., and xii.). Case xii. is the only one on the list in which I have not seen the sac. The fluid was sent to me by Dr. Thomas. I made the diagnosis, and when I communicated it to the operator, he said that he had arrived at the same conclusion from the relations of the sac, as revealed during the operation. In the two others, the sac had the following characters: it was monolocular, from one to two millimetres thick, covered with peritoneum, which was bound by very loose connective tissue to the wall proper. This was composed of dense connective tissue without smooth muscle-fibres, but, in case xi., with cells in a myxomatous arrangement. The inside was covered with a layer of non-ciliated, short columnar, small-celled, polygonal epithelium without any trace of villousities or pouches (Fig. 47).

Gusserow,¹ in a special paper on these cysts, says that the number of cases in which autopsy or ovariectomy rendered an anatomical examination possible is quite small. He enumerates only seven: one of Wagner (*Berliner klinische Wochenschrift*, 1868, p. 410), one of G. Müller (*Scanzoni's Beiträge*, v., p. 163), one of Spencer Wells (*Diseases of the Ovaries*, second edition, p. 31), one of Atlee (*Ovarian Tumors*, p. 103), one of Bantock (*Obstet. Journ. of Great Britain*, May, 1874, p. 124), and two of Koeberlé (*Gaz. méd. de Strasbourg*, 1873, p. 187). In all, the sac was covered with peritoneum. The inside was smooth; in Müller's case, it was covered with long cilia; in Koeberlé's, there was a single layer of columnar epithelium which here and there was ciliated; in Spencer Wells' case, the inside was covered with a flattened [?] polygonal epithelium. In the other cases, no mention is made of the histological character of the inner surface.

The fluid in all my three cases had much in common. It was colorless, light-yellow, greenish or opalescent, limpid or slightly turbid, not at all viscid or scarcely so. Its specific gravity was 1010 in the two cases in which it was taken. Its reaction was slightly alkaline or neutral. It did not coagulate spontaneously, nor did it coagulate by boiling or very slightly so before addition of an acid. I had not begun to test for paralbumen when these cases occurred. The microscopical exam-

¹ Gusserow in *Archiv für Gynäkologie*, 1876, vol. ix., p. 480 seq.

ination showed also much similarity between these three cases. There were remarkably few elements, very few red blood-corpuscles, small epithelial cells (Fig. 44), granules, no cholesterol. Bennett's large corpuscles were found in cases xi. and xii., in the former with dark granules and in comparatively great number (Figs. 45 and 46). Nuclei with shining granules (i. e., Drysdale's corpuscles) were found in cases v. and xi. (Fig. 19).

This fluid is different from that found in most myxoid cystomas, but on the other hand, it has the most striking likeness with that found in the true ovarian monocyst: same color, same appearance, same specific gravity, same properties in regard to coagulation. The only difference was, that in the ovarian monocyst no cells were present, but this is probably merely accidental. Since the epithelial lining in both kinds of cysts was found to be exactly alike, nothing is more probable

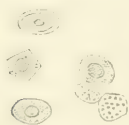


FIG. 44.



FIG. 45.



FIG. 46.

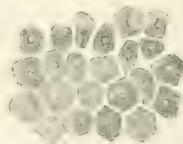


FIG. 47.

FIG. 44.—Small Epithelial Cells in Fluid of Cyst of Broad Ligament.

FIGS. 45 and 46.—Degenerated Epithelial Cells in Fluid of Cyst of Broad Ligament.

FIG. 47.—Inner Epithelium of Cyst of Broad Ligament.

than that in another case of true ovarian monocyst we might find small epithelial cells or their transformation into Bennett's corpuscles, or their nuclei in fatty degeneration. The smallness of the epithelial cells is not distinctive. I found similar small cells in tapped cases iv. (cancer peritonæi) and xi., which turned out to be an ovarian myxoid cystoma (operative case xxiii.). I hold, therefore, that it is impossible to tell by the fluid alone if a tumor is ovarian or a cyst of the broad ligament.

This view is corroborated by the experience of others. Waldeyer¹ has examined one in which he found that the deposit showed "the same characters as ovarian cysts." It is true it

¹ Waldeyer in *Archiv für Gynäkologie*, 1870, vol. i., p. 272.

did not contain any paralbumen, but this substance was found in large quantity in another case he examined. Lawson Tait¹ states that, in the majority of his cases of parovarian dropsy, the fluid has been thick even to viscosity. In one the specific gravity was 1024.6. In such parovarian fluids he has seen all the microscopic appearances, said by some writers to be characteristic of ovarian tumors. Duncan² says that he has seen it like honey in consistence, and like coffee-grounds in appearance. I wonder if these authors had excluded the possibility of intraligamentous development of ovarian cysts. In Spiegelberg's above-mentioned case, the fluid had also all the characters of ovarian fluid (paralbumen, no spontaneous coagulation, granular detritus, large cells with fatty granules, and cholesterin).

Westphalen³ states that similar cases were found by Scanzoni and Kiwisch, while, on the other hand, absence of albumen was found in three ovarian cysts by Naunyn.

In Müller's above-mentioned case was found much albumen, in Atlee's and Koeberlé's none, in Bantock's very little. In the other of the cases collected by Gusserow, the composition is not stated. The specific gravity was low in all cases; in Bantock's even 1003. It was clear like water, or slightly greenish, yellowish, or opalescent (Wagner, Atlee, Bantock).

It appears from the above that both ovarian cysts and cysts of the broad ligament may have serous or colloid contents, but the latter is common in ovarian cysts, rare in extraovarian cysts, while the watery fluid is common in extraovarian, rare in ovarian cysts, but may still be found, not only in true mono cysts (p. 9), but in multilocular cystomas (p. 43).

We come now to rarer kinds of cysts in regard to which my material has necessarily been scant, but on the other hand it will be found rich in rare cases, and besides I think it may be of practical value to have united in one place a synopsis of what is found scattered through books or periodicals in different literatures.

We will first mention

8. *Uterine Fibrocysts.*

This is a rather rare disease. While thousands of ovarian

¹ Tait in the *Lancet*, Feb. 7th, 1880.

² M. Duncan: *Clinical Lectures on Diseases of Women*, p. 191.

³ L. c., pp. 94, 95.

cysts have been described, nay more than a thousand operated on by a single man, Heer,¹ in a monograph on the subject, has only been able to collect seventy cases, and may be the diagnosis is not beyond a doubt in some of them. Thus, in the material used for the present treatise, the diagnosis was twice made by others, but a minute examination of all the features of the operations, the macroscopical relations, and microscopical structure, convinced me that the tumors were ovarian, and they have been mentioned above in the chapter on cystosarcoma of the ovary. Clinically, the diagnosis is still oftener made in cases of ovarian cysts intimately connected with the uterus.²

Dr. Emmet³ says in his dry, honest way, "I have, in former years, seen an unusual number of fibro-cystic tumors of the uterus, from my being so long in charge of the Woman's Hospital, where these cases were often sent when the physician met with difficulty in forming a diagnosis. But now, from a more wide-spread knowledge of these growths, I see comparatively few cases." Perhaps the late, lamented Dr. Peaslee,⁴ if he should give a new edition of his work, would also modify his former statement that he had met with ten cases in two years, and seen not less than fifty since his first ovariectomy in 1850. W. L. Atlee mentions only four cases in his work on Diagnosis of Ovarian Tumors. Spencer Wells, in a paper published in 1878, states that he had removed uterine tumors in twenty-four cases through an incised opening in the abdominal wall. Of these, twenty were solid and four only fibro-cystic. In the same year he reported a fifth case.⁵ Together with Keith's first one hundred operations of ovariectomy, only one case of uterine fibro-cyst occurred.⁶ Péan,⁷ the great specialist in regard to

¹ Heer: Die Fibrocysten des Uterus, p. 19. Zürich, 1874.

² See for instance a case of Dr. C. C. Lee, reported to the Obstetrical Society of New York, May 6th, 1879. AM. JOURN. OBST., 1879, vol. xii., p. 746. I have examined the pathologist's report of the post-mortem. He calls the tumor a multilocular adeno-cystoma of the right ovary, but since there was "a large amount of solid tissue," and no microscopical examination of the sac is mentioned, I am inclined to think that this was also a cysto-sarcoma, like two of the afore-mentioned cases.

³ L. c., p. 794.

⁴ Peaslee, l. c., p. 106.

⁵ Spencer Wells in British Med. Journ., July 27th and Dec. 14th, 1878.

⁶ The Lancet, Aug. 20th, 1870, p. 250, quoted by Peaslee.

⁷ Péan: Clinique Chirurgicale, 1879, vol. ii., p. 832.

uterine fibroids, had up to 1879 only operated seven uterine fibro-cysts, and three cysts which he calls "utéro-cystique," probably subperitoneal cysts; in all ten, against twenty-seven solid uterine fibroids and one sarcoma ("dégénérescence embryoplastique").

Péan¹ divides the cysts of the uterus in two classes, subperitoneal cysts and true uterine cysts. The first are more common, and contain generally a serous fluid, more rarely more or less pure blood, frequently bloody serum. The true or interstitial uterine cysts, that is to say those formed in the depth of the wall, he says, are exceedingly rare. There have scarcely been reported more than three or four cases. M. Demarquay (*Union Médicale*, 1868) has described a remarkable case of this kind. There was one large and several small cysts. Some of the latter contained a ropy fluid, exactly like that in the large cyst, others pure or scarcely changed blood. A microscopical examination revealed that the muscular elements came in immediate contact with the fluid contained in the sac. The fluid was serous. It contained a rather great quantity of red blood-corpuscles which had kept all their normal characters, very few, likewise normal, colorless blood-corpuscles, and besides some large granular cells which were spherical or sometimes irregular, and a little flattened, with very thin walls, and a nucleus in their interior, and almost opaque in consequence of a large quantity of fat-granules. The wall of the cyst was in some places formed by a yellow mass, which proved to be composed of uterine elements, full of fat-granules, and the interstices between the elements filled with the same kind of fat-granules. This excellent description allows us easily to recognize what, in treating of ovarian cysts, we have called *Bennett's corpuscles*.

Péan himself had a case² in which a subperitoneal cyst contained a sero-purulent fluid, and several smaller cysts, found in the thickness of the wall, contained, some a bloody, others a serous fluid. In another case, Péan³ tapped several times, and got every time an entirely different fluid. He does not describe it, but it must not have possessed any striking qualities, for he

¹ Péan: *Hystérotomie*, Paris, 1873, p. 90.

² *Ibid.*, p. 96.

³ *Ibid.*, p. 137.

adds that the diagnosis was far from complete, and that the fluid might come from a multilocular ovarian cyst. In still another case,¹ eighteen litres of a dark chocolate-colored, little ropy fluid, in which there swam blood-clots, were emptied during the operation.

In Storer's case² there were found several cysts, some filled with limpid serum, others with sanguinolent serum, and some perhaps with pure blood. Some of the cysts had entirely smooth walls, like those of common cysts.

In a case of Demarquay,³ five or six litres of a citrine and somewhat ropy fluid were emptied.

Koeberlé⁴ found in the two largest compartments three litres of a serous fluid very rich in *cholesterin*. In numerous smaller cysts, the fluid was limpid, citrine, lymph-like, and *coagulated spontaneously* in contact with the air, the coagulum being almost entirely composed of fibrin. Koeberlé thinks, therefore, that these tumors are due to lymphangiectasis, provoked by the pressure of the neoplasm on the lymphatic vessels. There is no doubt that some of the fibro-cysts have this origin. Similar cases have been minutely described by Fehling and Leopold,⁵ and Rein,⁶ and it is likely that Atlee's belonged to the same category, for they all contained an amber-colored fluid, which almost instantly coagulated *in toto*, the mass later separating into a fibrinous clot and surrounding serum. But the cysts more frequently contain a non-coagulating fluid.

According to Virchow,⁷ the fluid, especially in the small cysts, is almost colorless, or of a yellowish tinge, watery or viscid, most frequently like synovia. Later, and especially in large interstitial tumors, the vessels are much dilated and filled. True extravasations of blood occur, and the fluid shows a red, reddish-brown, yellowish-brown, or dark-brown color. He does not mention its coagulability nor microscopical elements.

¹ Péan: *Hystérotomie*, p. 154.

² *Ibid.*, p. 177; after *American Journal of Medical Sciences*, 1866.

³ *Ibid.*, p. 179.

⁴ *Ibid.*, p. 184.

⁵ Fehling and Leopold, in *Archiv für Gynäkologie*, Vol. vii., 1875, p. 531.

⁶ Rein, *Ibidem*, Vol. ix., 1876, p. 414.

⁷ Virchow: *Pathologie des Tumeurs*. Translated by Aronsohn, Vol. iii., p. 390.

Spencer Wells¹ says that in both cases described in his work on Diseases of the Ovaries, the fluid was a thin serum, with five, ten, or fifteen per cent of blood intimately mixed with it, and not separating until after some hours. In this way, he has satisfied himself, in at least four cases, that tumors which others considered to be ovarian, were really fibro-cystic uterine growths. In his above-mentioned fifth operation, there were nineteen pints of dark fluid, with which, as the cyst became empty, a little blood was mixed. His diagnosis was multilocular ovarian cyst. This was confirmed by Thornton, who reported on the tapped fluid that "the tests and microscope confirm its ovarian character," but unfortunately no details are given. Both ovaries were found healthy.

Most authors mention that the fluid contains so much *albumen* that it coagulates entirely by heat. Routh has found crystals of *uric acid* in it, and *pus*.² Trenholme³ likewise found a large purulent collection. In some cases, the fluid is described as bloody, and is, then, of course, full of blood-corpuscles. According to Virchow (l. c.), the hematin becomes dissolved in older collections, and forms all sorts of derivatives, inclusive of *hematoidin*. Atlee⁴ found *fibre-cells* in it which he believed to be pathognomonic, shrunken epithelial cells and oil-globules.

The following are the characters I find attributed to it by perusing the literature up to date. The fluid is colorless, yellow, bloody, or dark-brown; sometimes it coagulates spontaneously and quickly to one solid mass which later separates so as to form a fibrinous clot, surrounded by serum. It always coagulates entirely on boiling. It is watery or more or less viscid; it has neutral or alkaline reaction, and rather high specific gravity (1020-1025). It contains constantly a large amount of albumen, often fibrin, and sometimes crystals of uric acid, or hematoidin. The microscope sometimes does not reveal any objects (Atlee's case lxxvii.), but commonly are found red blood-corpuscles, sometimes spindle shaped cells (Drysdale), epithelial cells in a state of fatty degeneration, or with a shrunken

¹ Wells: Diseases of the Ovaries, p. 201.

² Herr, l. c., p. 56.

³ Trenholme in the Lancet, Nov. 20th, 1874. Schmidt's Jahrbücher, 1877, Vol. 176, p. 30.

⁴ Atlee, l. c., pp. 265 and 464.

appearance, fat-globules, pus-corpuscles, crystals of uric acid, hematoidin, and cholesterin.

I have myself met with but one case (liii.). It belonged to the variety described as *myoma lymphangiectodes* by Leopold and Rein. It was in a patient forty-five years of age, on whom Dr. Thomas operated April 9th, 1881. The clinical diagnosis was uncertain. No exploratory puncture had been tried. When the abdomen was opened half a pint of ascitic fluid was evacuated. First, large pieces were cut off from the tumor without any bleeding. Then the enormous tumor was drawn out, and Dr. Thomas' large clamp applied to the uterus proper. The tumor was somewhat dumbbell-shaped, being divided by a horizontal line into a superior and inferior half. On the upper half, toward the right side, were found two knobs, each of the size of a clenched fist. The tumor had many adhesions to the colon.

During the operation, once a clear fluid, about an ounce, spurted out from a cavity in the tumor. The tumor weighed nineteen and a half pounds. After its removal I cut open a cyst in one of the two large knobs mentioned. It contained half an ounce of a clear, citrine *fluid* which soon coagulated, and then separated into a clot and a surrounding fluid. The coagulum was reddish-gray, tough, and microscopical examination showed that it was composed of fibrin with a few red blood-corpuscles and some yellow bodies, which looked like *débris* of epithelial cells. The fluid was watery, and did not contain any histological elements. The reaction was strongly alkaline, much more so than is the case with ovarian fluid. It coagulated a little by heat, and entirely after addition of a drop of acetic acid. The coagulum thus formed was mostly redissolved by boiling with the same reagent in excess.

The *wall* of the cyst from which this fluid was taken was only between one and two millimetres thick, and easily separable into two layers, the outer of which was thinner, the inner thicker. On the outer surface no endothelium was found, except a few straggling cells which looked like flat epithelial cells in fatty degeneration. The inner surface showed an epithelial (or endothelial) lining. It was composed of flat, roundish cells, each with a rather large round nucleus. The single cells varied

rather much in size, some measuring sixteen by thirty-two μ others only eleven μ .

Both *ovaries* were removed separately. The right was healthy, except so far that at one end it contained a cyst of the size of a small hazel-nut. The left was somewhat enlarged ($6 \times 2.3 \times 1$ centimetres) and showed beginning cystic degeneration. The ovaries had no connection whatever with the tumor.

Between the right ovary and tube were found two small cysts of the size of a pea. One of these parovarian cysts was cut open, and was covered inside with polygonal columnar epithelium *without* cilia.

Where the tumor was cut off above the clamp, the *uterine cavity* was seen, and the uterus here appeared normal. The wall measured here two and three-tenths centimetres. Both tubes started from the cavity. It was found that the tumor had been developed in the posterior wall of the uterus. It formed a large, fleshy mass in which were seen everywhere smaller and larger cavities, the largest containing about an ounce of fluid. The cavities were lying close together, and extended almost to the peritoneum which was thickened. The septum between two cavities was sometimes as thin as tissue paper, but I never found two communicating. In one I found a gelatinous mass composed of fibrin and some large endothelial cells in fatty degeneration, much like the clear variety of Bennett's corpuscles.

Nowhere was seen the concentric arrangement of muscular bundles characteristic of common myomas of the uterus.

The cavities presented an entirely smooth, shining surface, resembling that of an organ covered with peritoneum or the interior of a blood-vessel. The lining membrane was easily torn from the surrounding uterine tissue, and was one millimetre thick. By scraping, large flakes were obtained, showing that the cavities were lined with a uniform *endothelium*, composed of similar flat cells as those seen in the large cyst.

A piece of the cyst from which the fluid was taken, was hardened in Müller's solution and alcohol, and sections taken from it. It did not show any trace of smooth muscle fibres. Innermost was, in many places, found the endothelium observed when the specimen was fresh. The inner part of the wall proper was

composed entirely of very large cells, with wing-like prolongations in all directions, lying in an amorphous basis-substance. The outer part was composed of longitudinal connective tissue fibres with few interspersed cells.

Sections from that part of the tumor, which contained many small cysts, showed a great many cavities, some of which were recognizable as blood-vessels by their thick walls, regular shape, and sometimes the presence of red blood-corpuscles. These openings were few and small. Another kind of cavities were very irregular in shape, sometimes mere long fissures, at other times of more roundish appearance. These had no separate wall, except that in some an endothelial lining was visible. The surrounding tissue was composed of smooth muscle-fibres.

The *ascitic fluid* evacuated from the peritoneal cavity was of a dirty yellowish-red color with white flocculi. This fluid did not coagulate immediately as that from the cyst, but some hours later, the fluid having been standing undisturbed, a coagulum had been formed which was almost as large as the whole mass and surrounded by a small quantity of citrine fluid. Next morning it had shrunk to half its size, was lying on the bottom of the vessel, and had a reddish-yellow color like an apricot. The fluid surmounting it was perfectly clear, citrine, alkaline, specific gravity 1022. Boiling alone caused some precipitation, and on addition of a drop of acetic acid the whole mass became firm, but this coagulum was entirely redissolved by boiling with acetic acid in excess.

The coagulum found in the untouched fluid had so little cohesion, that it was easily mixed with the fluid by shaking, although it was coherent enough to be raised with a spoon and folded. The shaken fluid contained, first, many red blood-corpuscles; second, flakes of flat, roundish epithelial cells in a state of more or less pronounced fatty degeneration, *i. e.*, with small black, or larger, clear circular granules. Most of the cells had a distinct nucleus, the largest being sixteen μ in diameter with a nucleus measuring eight μ . Third, numerous lymphoid bodies without amœboid movements were found. As in many cases the nucleus of the endothelial cells was seen quite plainly while the body was almost dissolved, and as these nuclei appeared exactly like what we have called lymphoid bodies, it is probable that many of them, at least, had this

origin. After the coagulum had been mixed with the fluid, the specific gravity had risen to 1024.

According to Atlee's book, the *diagnosis* of uterine fibro-cysts by the fluid would be an easy matter, for it is said to have two entirely characteristic properties. It coagulates in the course of a few minutes to one solid mass, so that the bottle can be turned without spilling a drop, and no other abdominal fluid has this property.¹ Secondly, it contains in most cases a spindle-shaped cell which likewise is pathognomonic, being simply a smooth muscle-fibre detached from the wall of the cyst in which the fluid is contained.² Unfortunately these statements are not borne out by the experience of other observers. It is true that this instantaneous and total coagulation without the addition of any chemical agent, by the mere exposure to the air, is very different from the coagulation which exceptionally has been observed in ovarian cyst-fluid and from that found, as a rule, in ascitic fluid (see below), but this phenomenon seems to be rather the exception than the rule with uterine fibro-cysts. Heer has collected sixty-five cases from literature, in ten of which only coagulation is said to have taken place, and he describes five new cases from Frankenhäuser's clinic. Out of three submitted to extirpation or tapping, one only contained a rapidly coagulating fluid. Of the cases published since Heer's treatise, the characteristic coagulation took place in Fehling and Lepold's, Spiegelberg's,³ and Rein's cases, while Trenholme merely found pus, Kimball⁴ fifteen and a half litres of a straw-colored, thin fluid, and Krassowsky⁵ thirty-six pounds of dark, viscid fluid. The phenomenon of total and instantaneous coagulation is so striking, and has been laid so much stress on by Atlee in America and different European writers, that it is very unlikely that it should not be mentioned in every case in which it occurred. Howitz⁶ states expressly that, in his case, he emptied seven quarts of fluid which did not coagulate in the test-tube.

¹ Atlee, l. c., p. 289.

² Ibid., p. 464.

³ Spiegelberg in Archiv für Gynäkologie, 1874, vol. vi., p. 34.

⁴ Kimball in Boston Med. and Surg. Journ. Schmidt's Jhb., 1877, vol. clxxvi., p. 35.

⁵ Krassowsky: Schmidt's Jhb., ibidem.

⁶ Howitz: Gynäkologische Meddelelser, vol. ii., p. 280.

We must now examine the *alleged cases of spontaneous coagulation of ovarian cyst-fluid*, because they are put in evidence as proving that no conclusion can be drawn from the spontaneous coagulability of a fluid. Virchow¹ says, in speaking of a modification of fibrin, which he calls fibrin with late coagulation ("Fibrin später Gerinnung"), that it is sometimes found together with colloid masses in ovarian tumors. In another place,² he gives some details of a case. The patient was punctured twice. At the first operation were withdrawn five quarts of a brownish fluid, which *began to coagulate soon* after being emptied, and contained much albuminate of soda and cells with fatty granules. At the second operation, undertaken four weeks later, ten quarts of a somewhat thinner, more yellowish fluid, with a specific gravity of 1017.2 were withdrawn, which also *began to coagulate spontaneously some time after being withdrawn*. At the autopsy, the two cysts that had given the fluid were seen to belong to what he calls a colloid tumor of the ovary, by which he only means a common ovarian cystoma. It will be noticed that the coagulation began some time after the fluid had been withdrawn, and that it is not stated to what extent it took place. It is, therefore, very likely that this process was a slow one, and limited to the formation of some fibrinous flocculi, as have been more minutely described in the following case of Schroeder's. This is so much more probable, as Virchow refers to the first quoted place where he had spoken of slowly coagulating fibrin, such as may be found in an old hydrocele.

In a patient of Schroeder's,³ a fluid was withdrawn which is expressly stated to have had all the appearances of ovarian fluid. It was viscid, ropy, rather dark-brown, coagulated entirely on boiling, contained paralbumen, specific gravity 1020. *After it had been exposed to the air for about twenty-four hours, cloudy coagula formed, which slowly sank to the bottom*. The microscope revealed that they were composed of fibrin. Columnar epithelial cells were not found. The absence of these cells and the presence of fibrin weighed so much in the operator's mind that an operation was desisted from.

¹ Virchow: Archiv, Vol. i., p. 117.

² Virchow, in Verhandlungen der geburtshülflichen Gesellschaft in Berlin, Vol. iii., p. 217.

³ Röhrig, in Archiv für klinische Medicin, xvii., p. 357.

The autopsy showed that the fluid was contained in an ovarian cyst the pedicle of which was twisted three times. I would remark about this case that, while the presence of columnar epithelial cells proves the cyst to be ovarian or a kindred cyst, their absence does not prove anything. The coagulation was of the late kind, not the instantaneous. Thus, nothing was found in this fluid which warranted the diagnosis of a uterine fibro-cyst.

The third case adduced is that of Spencer Wells.¹ This was a dermoid cyst with bones and hair. In some isolated cysts there was an emulsion of fat and cholesterin; in others, the albuminoid liquid so common in ovarian dropsy; and thirdly, in different parts of the large tumor, "certain small isolated bags full of limpid thin serum, which, being exposed to the atmosphere, soon coagulated, like any other serous fluid overcharged with fibrin." In this case, we will notice that the large cysts contained characteristic dermoid and myxoid ovarian fluid, and that the coagulating fluid seems to have been inclosed in small lacunæ of the solid mass. If an exploratory puncture had been made with an instrument of proper size, it is, therefore, not likely that the deceiving fluid would have been withdrawn.

This is illustrated by Olshausen's case.² Olshausen drew off fluid in two places with a hypodermic syringe. It was scarcely turbid, thin, light-yellow, and *coagulated immediately and completely*. The clot was like gelatin, and did not give off any serum on standing. Later, the same patient was tapped with a large trocar, and twenty-two pounds of fluid of a specific gravity of 1016 were withdrawn. This time nothing is said about its coagulating. At the autopsy was found that it was a cysto-sarcoma of the ovary, which was essentially a solid tumor, although containing many lacunæ and crevices. In this case, indeed, immediate and complete spontaneous coagulation took place, but the fluid was withdrawn from the solid part of the tumor, and besides it differed from Atlee's by not separating into a clot and serum after standing a while. Anyhow this case is a very important one, and shows as well as the preceding one that the quantity withdrawn by the hypodermic syringe is so small that no reliable diagnosis can be based on it.

¹ Diseases of the Ovaries, p. 133.

² Ovarienkrankheiten, p. 161.

Klob's¹ and Westphalen's² cases do not at all disprove Atlee's statement, for in both it is expressly stated that no spontaneous coagulation took place at any time. In Klob's, a few drops of blood were added to a part of the fluid, and the whole of this formed after three hours a thin jelly. In Westphalen's case, the fluid of the main cyst did not coagulate spontaneously, nor did that of a smaller cyst of the size of two fists, but, on addition of serum of blood, almost the whole mass formed one large coagulum.

Peaslee is also quoted as instancing spontaneous coagulation in ovarian cyst-fluid, but all we find in his book³ on this subject as a list of chemical analyses of ovarian fluid by Becquerel, showing what the chemist himself calls "traces of fibrin," or reaching at most 0.071 per thousand. Here is not the least proof that these fluids showed any kind of coagulation, much less the instantaneous and complete one described by Atlee.

When, now, we review the evidence with regard to coagulation, we come to the result that, so far, all cases in which a sufficiently large quantity of fluid was withdrawn (a couple of ounces ought always at least to be taken), and coagulated spontaneously, promptly and completely, have proved to be fibro-cysts of the uterus; in other words, that Atlee's test has positive value. But, on the other hand, it has no negative value; that is to say, from the absence of this kind of coagulation cannot be inferred that the tumor in question is not a uterine fibro-cyst. The presence of a fluid which, after long exposure to the air precipitates fibrinous clouds, or gelatinizes on addition of blood or serum, does not prove that it comes from a fibro-cyst.

As for Atlee's second test, the presence of the fibre-cell,⁴ I find it mentioned in only one case, Frankenhäuser's first.⁵ It may, of course, have been present in many others, and it is very likely that it would be found in those cases in which there is no epithelial layer on the cyst-wall, and the fluid is in immediate contact with the smooth muscle-fibres of which the uterine tissue is chiefly composed. That it is not always found

¹ Klob: *Pathologische Anatomie der weiblichen Sexualorgane*. Wien, 1864, p. 357.

² L. c., p. 85.

³ L. c., p. 38.

⁴ Atlee, l. c., p. 464.

⁵ Heer, l. c., p. 23.

appears even from Atlee's own experience. In fact, of his four cases, it is only mentioned in one (case lxxvi.). In case lxxvii., it is expressly stated that microscopical examination did not reveal any objects. In case lxxix., the serum contained only a few blood-corpuscles, fragments of tissue undergoing fatty degeneration, etc. In case lxxx., no mention is made of the microscopical elements.

If the fibre-cell is not always found in uterine fibro-cysts, on the other hand it may be found in ovarian cysts. I found it in great number in my case xv., which was a myxo-fibromatous cyst of the ovary (see p. 26), in which the wall in many places was composed of such cells. Dr. M. D. Mann,¹ of Hartford, Ct., my predecessor as pathologist of the New York Obstetrical Society, found similar cells in the fluid of a case of ovarian cystoma, containing in many places large bundles of smooth muscle-fibres.

The other cellular elements which have been found in uterine fibro-cysts were epithelial cells, shrunken, or in fatty degeneration (Bennett's corpuscles). This corresponds with the fact that De Sinéty,² who has so great a merit for having investigated the microscopy of gynecological diseases, has found pavement epithelium in these cysts, and Rein (l. c.) and others, as well as myself, have found an endothelium on the walls. In most cases, competent observers have failed to find any kind of epithelial lining.

None of the microscopical elements found have any diagnostic value. We notice only that columnar epithelial cells, such as are characteristic for cysts of the ovary or broad ligament, have never been found in uterine fibro-cysts.

9. *Amniotic Fluid.*

If there be any suspicion of pregnancy in a given case, tapping of the uterus ought, of course, not to be thought of, but, since such cases have been unexpectedly found in performing ovariotomy, it might also happen that amniotic fluid was obtained by exploratory puncture, and we must, therefore, describe it.

In case xxviii. of the list of tapped fluids, I collected the

¹ Transactions of the New York Obstetrical Society, Vol. i., p. 100, 1879.

² Manuel de Gynécologie, p. 415.

liquor amnii at the moment of the breaking of the waters in a normal pregnancy at term. It was of a dirty yellowish-gray color, serous, turbid, full of small white flocculi, alkaline, had the odor peculiar to the female genitals, did not coagulate spontaneously, nor on boiling, but it did so on boiling with a drop of acetic acid. The precipitate was not changed by boiling with excess of acetic acid, but became much clearer by adding potassa.

The microscope revealed the presence of oil-globules, irregular fat-granules, large flat cells (Fig. 48), $48\ \mu$ long by $21\ \mu$

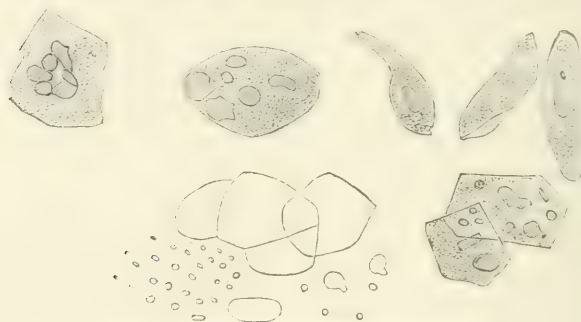


FIG. 48.—Epidermal Scales in Liquor Amnii.



FIG. 49.—Liquor Amnii Cells, the Fat of which has been drawn out with Ether.

μ in thickness, containing fatty masses like those found free in the fluid. Often these cells were found in groups, and seen to cover one another partially. The fatty mass was sometimes much like bits of paraffin sticking to microscopical specimens. When ether was poured on a drop of the fluid, the fat was drawn out of the cells, which then looked shriveled, and showed an irregular meshwork (Fig. 49); in some, a nucleus was visible.

The fatty masses in and outside of the cells differed entirely from all that I have seen in any other fluid, and they would be sufficient for a diagnosis. I take all the cells to be changed epidermal scales. The amnion itself is indeed covered with an epithelium, but there the cells never overlap one another, and are short columnar, not flat.

10. *Dropsy of the Fallopian Tube.*

The dropsy of the Fallopian tube is a disease of extremely rare occurrence, especially those cases in which the cyst becomes large enough to form a tumor. Scanzoni¹ has described one which had the size of the head of a child ten years old. The correctness of the diagnosis is doubted in all cases which are said to have contained many pounds or quarts of fluid.

Klob² says that the fluid usually is a thin light-yellow serum. In large collections especially it has almost always this character. In many cases it contains a large amount of small scales of cholesterin. In less developed degrees of the disease, the fluid, from more or less considerable admixture of blood, may be brownish, greenish-brown, or even black as ink, thick, mucous, and ropy. This is corroborated by A. Meadows' case, in which there were three small cysts, the fluid being dark, thick, grumous, of a prune-juice color.³ Foerster⁴ gives a similar description as Klob, only adding that sometimes the fluid is turbid from suspended flocculi. Peaslee⁵ says that it contains mucus and but little albumen; Koeberlé,⁶ that it contains albumen but no paralbumen, so that the precipitate formed by nitric acid is rather increased by acetic acid.

The only case I find with a report on the microscopical properties is that of Frankenhäuser,⁷ described by Hausammann. By pressure on the tumor, half an ounce of clear, blood-colored serum was pressed out through the os into the speculum. It contained scarce fresh or shrunken red blood-corpuscles, a little pavement epithelium, but no vibratile cells. If the description of the epithelial cells is correct, they must have changed character by pressure, but, as in ovarian cysts, where the pressure is probably at least as great, I have found the columnar character preserved without exception, I do not feel quite convinced of the correctness of the observation.

¹ Scanzoni: *Krankheiten der weiblichen Sexualorgane*. Wien, 1857, p. 318

² Klob, l. c., p. 290.

³ Meadows, in *Trans. Obstet. Soc. London*, Vol. viii., p. 141.

⁴ Foerster: *Pathologische Anatomie*, vol. ii., p. 397. Leipzig, 1863.

⁵ L. c., p. 156.

⁶ Koeberlé: paper read before the Med. Soc. of Strassburg, Nov. 15th, 1875; *Obstet. Journ. Gt. Br. and I.*, Vol. iv., p. 277.

⁷ Bandl: *Krankheiten der Tuben*, etc., p. 21. Stuttgart, 1879 (*Billroth's Frauenkrankheiten*, v.).

It would appear from these data furnished by pathologists and clinicists that the fluid is so little characteristic that no diagnosis can be based on it. The clear, serous fluid might be like that found in cysts of the broad ligament and some ovarian cysts. The presence of paralbumen would argue in favor of an ovarian cyst. The bloody or dark-colored, thick fluid must be much like that found in many cases of uterine fibro-cysts. But since large tumors of hydrosalpinx are so exceedingly rare, an examination of the fluid would so rarely lead to an erroneous diagnosis, that it cannot detract much from the value of this means of diagnosis.

11. *Lymphangiectatic Myoma of the Round Ligament.*

Leopold¹ has described a large tumor which he takes to be a lymphangiectatic myoma of the round ligament. In this case, the fluid was thick, yellowish-brown, coagulated very easily on exposure to the air or to heat. In other words, it had exactly the same physical characters as similar tumors found in the uterus. The microscopical appearance is not stated.

12. *Cysts of the Abdominal Wall.*

As a rule, there will be no difficulty in distinguishing ovarian cysts from those situated in the wall of the abdomen, but in operative case vii., occurring in Dr. C. C. Lee's service at the Woman's Hospital, the diagnosis was somewhat doubtful. The womb was enlarged, and the fluctuating, nodule tumor, of the size of a fist, situated in the hypogastric region, which had been developed in the course of two years, seemed to move with it. It was a cyst situated immediately below the subcutaneous fascia, from which it could be separated by finger and scalpel. The posterior wall was so intimately connected with the sheath of both recti muscles, that part of it had to be cut away, exposing both muscles bare at the bottom of the wound. The inner surface appeared in some places smooth, but most of it was covered with fleshy shreds which formed a kind of cobweb bridges, going from one point to another. In some places this growth formed a continuous red membrane ("membrane pyogénique" of the French). It consisted of connective tissue

¹ Archiv für Gynäkologie, 1880, vol. xvi., p. 406.

crowded with inflammatory elements. There was no epithelium.

The fluid was purulent. It consisted of pus corpuscles and some bodies entirely like Drysdale's ovarian cells. These were evidently the pyoid bodies described by Lebert. They were quite pale, contained a few clear granules, and acetic acid had scarcely any effect on them. But, as no kind of epithelial cells were found, the fluid differed from that found in my two cases of ovarian cysts (page 25. Even case iv. contained some).

Serous and bloody cysts may also be found in the subcutaneous layer of the wall of the abdomen. Similar cysts may be situated between the muscles and the peritoneum, both in the anterior and the posterior wall. Their fluid is, of course, quite different from that of ovarian cysts.

Exceptionally these cysts of the abdominal wall acquire such proportions that it would be very embarrassing for a man who had not seen the development of the case to tell them from intraperitoneal abdominal tumors. Thus Chantourelle¹ describes one which covered almost the whole abdomen. By tapping, two pounds of albuminous, inodorous, transparent, limpid fluid of a beautiful lemon-color were withdrawn. No microscopical examination is mentioned, but the physical appearance, besides the comparatively small quantity of fluid coming from a tumor which seemed to fill the abdomen, would be enough to exclude an ovarian cyst.

Cruveilhier² describes a case of a subperitoneal serous cyst in the left lumbar and iliac region, and adds that, if he had seen it in the patient's lifetime, he certainly would have taken it for an ovarian cyst. It was filled with a limpid, serous fluid. Since this was found in a cavity formed in the connective tissue surrounding the left kidney, it cannot have contained other formed elements than some leucocytes, and there is, therefore, scarcely a doubt that it would have been possible by the examination of the fluid to exclude an ovarian cyst.

Under the name of encysted aqueous tumor of the kidney, Hawkins³ has described a tumor which seems to have been something like this, since the kidney was healthy, but its ante-

¹ Chantourelle in *Archives Générales de Médecine*, 1831, vol. xxvii., p. 218.

² Cruveilhier : *Atlas d'Anat. Pathol.*, vol. iii., p. 508.

³ Hawkins in *Medico-Chirurgical Transactions*, xviii., p. 175, 1833.

rior surface formed, as it were, part of the cyst. In this case the fluid amounted to five pints, was nearly transparent, contained a good deal of white semi-purulent matter, but *did not coagulate by heat*. The author states expressly that it was not a hydatid.

13. *Cysts of the Urachus.*

There is a kind of cyst in the anterior abdominal wall which deserve to be mentioned in particular. Cysts formed in the urachus, that remnant of the allantois, which normally is a mere thin ligamentous string extending from the top of the bladder to the umbilicus, acquire sometimes such proportions as to be easily taken for ovarian cysts. They even seem not to be excessively rare. Hoffmann¹ has described two cases, one of which at the autopsy contained fifty litres of fluid, Wolff² one, and Roser³ two. Wolff thinks that many a cyst has been extirpated and thought to be ovarian, which really was a urachus cyst. He thinks even that the cases mentioned by Spencer Wells⁴ of ovarian cysts without pedicle were cysts of the urachus; but in this he is evidently mistaken, for Spencer Wells states expressly that in his first case there was not even any adhesion to the abdominal wall, and the second was a dermoid cyst.

Hoffmann gives the best description of the fluid. In his first case the microscope revealed a large amount of cholesterol, red blood-corpuscles, and debris. The inside of the cyst was lined with flat epithelium. In the second case, the cyst suppurated and broke, discharging a bloody, purulent fluid which contained onion-like balls of conglomerated flat epithelial cells. In Wolff's case, there was an abundant deposit of pus and debris. In Roser's first case, there was a communication with the bladder, so that the fluid was urine. In his second, which he took for an ovarian cyst, he extirpated a cyst as large as the head of an adult. The fluid was sero-purulent.

It appears from the above that when the fluid was well examined, even when purulent, it differed from that of ovarian cysts by containing flat epithelial cells.

¹ Hoffmann in *Archiv für Heilkunde*, vol. xi., p. 373, seq., Leipzig, 1870.

² Wolff: *Dissertation*. Marburg, 1873. Abstract in *Langenbeck's Archiv*, vol. xx., p. 477, 1877.

³ Roser in *Langenbeck's Archiv*, vol. xx., p. 472, 1877.

⁴ *Diseases of the Ovaries*, pp. 84, 85.

Roser describes on the same occasion a cystic tumor which from its position at the navel he thought was a urachus cyst, but which, on microscopical examination by the celebrated anatomist Lieberkühn, was found to be lined with the kind of glands which in the intestine bear his name, and which, therefore, was interpreted as a *cyst of the vitelline duct*. It had a diameter of six centimetres, and discharged through the umbilicus a mucous fluid containing columnar epithelial cells. Such a fluid, then, would be so like ovarian that it would scarcely be possible to distinguish them. But the case so far is unique and the patient was a man.

14. *Spina bifida*.

Dr. Emmet¹ reports a rare case of *spina bifida* forming a tumor in the pelvis, which had the appearance of an ovarian cyst. At the autopsy there was found a large opening in the anterior part of the sacrum, through which a sac communicating with the spinal canal had entered the pelvis. The fluid drawn off in the life-time of the patient was serous, perfectly clear and limpid, "resembling hysterical urine. It contained no albumen, and the microscope revealed nothing but a few oil-globules, which had beyond question been attached to the instrument before its introduction." It was consequently entirely different from that of ovarian cysts.²

¹ Gynecology, p. 79.

² Since this treatise was finished, a case, which is much like Dr. Emmet's, has occurred in Spiegelberg's clinic, and is most excellently described by Kroner and Marchand, in *Archiv für Gynäkologie*, vol. xvii., 3, pp. 444 to 474. Only, I am surprised that the authors have entirely overlooked Dr. Emmet's case. Before anything in gynecology is called "unique," it is wise to look for it in the work of a man who has perhaps a larger personal experience in this department than any other. Spiegelberg's case has particular interest for us because the fluid was examined twice. When the sac first was emptied by puncture, it contained three litres of colorless, limpid, thin fluid, with alkaline reaction, specific gravity 1007, traces only of albumen, mucin, no paralbumen, no sugar. The microscope did not reveal any kind of formed elements. Ten days later, the cyst having refilled under high fever, it was opened by an incision into the vagina, and now the fluid contained numerous red blood-corpuscles, some granular cells, and many large flat cells like those of the peritoneal endothelium. At both occasions, then, it differed in chemical and microscopical characters from that of ovarian cysts.

15. *Hydatids (Echinococci).*

Hydatids have been found both in the uterus and the ovary, and, even when they are developed in other parts of the abdomen or in the abdominal wall, they are often exceedingly like ovarian cysts.

The character of the fluid is in many cases the only means of diagnosis. Its aspect is not characteristic. It is colorless, opalescent, or yellow, clear or turbid. It is either without albumen, or contains only traces of it. We have seen the same in some ovarian cysts. But in the fluid of echinococci are found succinic acid,¹ leucin,² grape-sugar, and inosite.³ Baldini⁴ found uric acid and urea in an echinococcus, situated in the retroperitoneal connective tissue below the right kidney. The microscope may reveal hooklets from the *scolecæ*, or young tape-worms, developed in the interior, or particles of the *cuticula*, *i. e.*, the membrane of the sac, which is easily recognized by being formed of fine parallel, structureless layers presenting the utmost regularity. Dr. Chadwick⁵ has pointed out that these are not affected by acetic acid, in which respect they differ from layers of fibrin found in coagula.

A single hooklet or the smallest piece of cuticula is pathognomonic for an echinococcus, but they are not always found. I have reported a case of a hydatid in the liver,⁶ which was tapped twice. At the first tapping no microscopical elements were found, but the second furnished numerous hooklets and heads of echinococci. We have seen that ovarian fluid may be clear, colorless, and free from albumen, but even the clearest I have found contained fat-globules and paralbumen (case xxxiii.). I think, therefore, that the diagnosis can be made with certainty, either by aid of the microscope or of chemistry.

¹ Gorup-Besanez: Handbuch der physiologischen Chemie, p. 274. Braunschweig, 1862.

² Westphalen, *l. c.*, p. 90.

³ Naunyn and Wyss quoted by Waldeyer, *Archiv für Gynäkologie*, vol. i., p. 273.

⁴ Baldini, *Centralblatt für Gynäk.*, 1878, vol. ii., p. 512.

⁵ Freund and Chadwick: *Four Cases of Echinococci in the Female Pelvis*, *AM. JOURN. OBSTET.*, Feb., 1875. Reprint, p. 12.

⁶ Garrigues: *Hydatids in the Liver treated by Cauterization*. *Proceedings of Kings County Society*, July, 1876, p. 127.

16. *Cysts of the Mesentery.*

Dr. Robert Watts,¹ of this city, has removed a large cyst from the mesocolon of a woman, which was taken for an ovarian cyst, even after the abdomen had been opened. The fluid it contained was reported by Dr. Delafield to be clear serum. Thus a diagnosis from ovarian cyst could probably have been made by examining the fluid beforehand.

Péan² has removed large cysts of the mesentery in three cases. In the first, were found ten litres of a yellowish-brown turbid fluid; in the second, twelve litres of a serous, yellow, limpid fluid; in the third, fourteen litres of a fluid, the characters of which he does not state. In no case a microscopical examination is mentioned.

17. *Cysts of the Spleen.*

Cysts of the spleen must be of exceedingly rare occurrence. In all the extensive literature I have examined in order to collect materials for supplementing my own experience with cystic fluid, I have found only a single case, viz., that of Péan, who, thinking it was an ovarian cyst, removed it. It contained three litres of a thick, viscid, yellowish-brown fluid, in which were found a very considerable proportion of albumen, leucocytes, crystals of cholesterin, red blood-corpuscles in different degrees of alteration, and finally some calcareous granules. Péan says that it did not differ much from that met with in certain ovarian cysts, but the total absence of epithelial cells or their derivatives in so thick a fluid would show at once that it could not come from a cyst of the ovary.

18. *Cysts of the Liver.*

Leaving out of view echinococci of which we have spoken above, cysts in the liver are likewise exceedingly rare. Atlee thought his case xxxviii. was one. He withdrew by

¹ Watts in Transactions of Obstetrical Society of New York. AMERICAN JOURNAL OF OBSTETRICS, 1879, xii., p. 333.

² Tumeurs de l'Abdomen, pp. 1,111, 1,112 and 1,115.

³ Tumeurs de l'Abdomen, pp. 1,006, 1,051, 1,056. Other cases of splenic tumors have been mistaken for ovarian cysts, but then the tumors were solid, combined with ascites.

tapping twenty-seven pints of cider-colored fluid, upon which floated a thick transparent oleaginous stratum, which was shown by the microscope to be composed of cholesterin. The underlying fluid coagulated by heat. But as the patient recovered, the diagnosis is not certain. At all events it is very unlikely that there could be any resemblance between this fluid and ovarian. The mere fact that no kind of bodies are mentioned except crystals of cholesterin, although the microscope was used, goes far to show that the fluid did not contain any microscopical elements resembling those commonly seen in ovarian fluid.

Atlee gives the history of another case (xxxix.) A boy was struck by the tongue of a fire engine in the right side below the ribs. A cyst formed from which were tapped fifteen and a half pints of a fluid which in color and consistence resembled bile. He died two months later, when a cyst was found occupying the greater part of the abdomen and dipping down into the pelvis. The common duct of the liver had been torn completely across and terminated in the cyst. It is not stated if the fluid had retained the same characters.

The presence of bile was made out by nitric acid in a case of Hawkins.¹ The same author quotes several other cyst cases, and among them that of a young lady, in which the cyst contained sixteen pints of water,² and says that this was evidently an encysted aqueous tumor, not a hydatid. I fail to see why. So large a cyst in any abdominal organ might easily be taken for ovarian, but probably the diagnosis could be made by the characters of the fluid.

I have myself examined the fluid in one case (tapped case xxxvii.) which by the physician in charge, Dr. Arthur Townsend, was believed to belong to this category. The patient was a man who had been suffering from Bright's disease and jaundice. A tumor was recognized in the epigastrium which, having acquired large proportions in a fortnight, was aspirated, and yielded five pints of fluid. The fluid was greenish-brown, turbid, alkaline, spec. grav. 1013, of a most repulsive stinky odor. No spontaneous coagulation, a little by boiling, and more after addition of acetic acid. The coagula remained unchanged

¹ Hawkins: Encysted Aqueous Tumors of the Liver, in *Med. Chir. Trans.* 1833, p. 99.

² *Ibid.*, p. 121.

in excess of boiling acetic acid. Being brought in contact with nitroso-nitric acid it showed the rainbow-colored rings characteristic of the coloring matter of bile. The microscope revealed a large amount of red blood-corpuscles, some round colorless bodies, which seemed to be colorless blood-corpuscles, and large globular or irregular polyhedric bodies full of pigment, mostly yellow, which may have been developed of the preceding class. No epithelial cells. The patient died two days later. The autopsy showed a large cyst with thin walls, situated between the diaphragm, stomach, left lobe of liver, and spleen. It was easily separated from all except the diaphragm, with which it was grown together. The gall-bladder contained a calculus, and another entirely obstructed the common duct. Since the whole body was icteric, the presence of bile in the cyst does not prove its development from the liver, and since it could be separated from the liver, it is not even very likely that it originated from this organ.

Dr. P. F. Mundé has informed me that he, a few years ago, tapped a case of unquestionable liver cyst. The patient was about 35 years old. The tumor was so large as to give the appearance of eight months' pregnancy. She was not icteric. The doctor took the tumor to be ovarian until he had aspirated some of the fluid with a hypodermic needle. It was clear, yellowish or light brown. Fuming nitric acid gave the characteristic concentric rings of rainbow colors due to the coloring matter of the bile, and the microscope revealed the presence of liver cells and granular matter. The diagnosis thus being settled by the examination of the fluid, the doctor advised abstinence from operative interference.

19. *Hydronephrosis.*

When the ureter is blocked up by a stone or simply made impervious by a sharp bend, collections of fluid large enough to simulate ovarian cysts may be accumulated in the pelvis of the kidney. Spencer Wells¹ mentions three cases of the kind. In the first, he operated, believing to have to deal with an ovarian cyst; in the second, the diagnosis was made from the position of the intestine in front of the tumor, and proved by autopsy to be correct; in the third, he made an ex-

¹ Diseases of the Ovaries, pp. 211, 214 and 217.

ploratory incision. In the first case fifteen pints of fluid escaped. It had the appearance of pea-soup. No microscopical nor chemical examination is mentioned. In the second, five or six pints of yellowish pyoid fluid, with mucus floating in it, were removed, and, at a second tapping, there was "nothing characteristic" in the fluid. He does not state if it was examined with tests or the microscope. In the third case, twelve pints of fluid escaped through the canula. It was clear, light yellow, with a faint urinous odor, acid reaction, and specific gravity of 1006. Urea, urates, and chlorides were found in about the normal proportions of healthy urine. There were traces of uric acid. A very small amount of albumen and phosphates, but no traces of sugar could be detected. On microscopic examination, large numbers of red blood-corpuscles were seen, a few pus-cells, some squamous epithelial cells and granular cells, but neither tube-casts nor crystals.

The acid reaction, the large amount of urea, and the presence of squamous epithelial cells would have sufficed to make it certain that it was not an ovarian cyst.

Rayer,¹ who is the author of the name by which this disease now goes, has described a case in which both kidneys were affected. In the right kidney was found a fluid smelling of rotten eggs, and forming by standing an abundant white deposit. Its reaction was neutral. It contained albumen, mucus, and a large proportion of urea. The fluid in the left kidney was reddish and transparent, and contained likewise albumen and urea. No microscopical examination is mentioned. But the large amount of urea would suffice to exclude ovarian fluid.

A case described by Fränkel² was likewise quite characteristic. The fluid had a strong urinous odor, and dull straw-color. Reaction feebly acid. In the deposits were found pus-cells and flat epithelial cells. The fluid contained much albumen, a large amount of urea, but only few chlorides.

The acid reaction, the large amount of urea, and the flat epithelial cells would suffice to settle the diagnosis.

But other cases have presented much greater difficulties. The urea may become much diminished in amount. Thus in a case

¹ Rayer: *Maladies des Reins*, vol. iii., p. 502. Paris, 1841.

² Fränkel in *Archiv für Gynäkologie*, vol. vii., p. 358, 1875.

described by Krause,¹ the fluid examined after death was feebly alkaline, of a specific gravity of 1000 [?]. One hundred cubic centimetres contained 0.33 grammes or per cent chlorine, 0.11 grammes or per cent albumen, and only 0.47 grammes or per cent urea, while J. Vogel² in a large number of examinations of normal urine found the average to be 23.3 per thousand or 2.33 per cent.

In this case the low specific gravity might, if correct, have excluded an ovarian cyst. No microscopical examination is mentioned.

Simon³ has described a case in which the fluid contained very much albumen, merely traces of urea, and no uric acid. Red blood-corpuscles and their débris were the only microscopical elements. This latter circumstance might at least have awakened a strong suspicion that it could not be ovarian.

The small amount of urea present would be of no avail, for a small quantity of this substance has also occasionally been found in ovarian cysts. Röhrig⁴ has given a detailed description of a patient of Schroeder's who is a good illustration of the fact that ignorance is sometimes preferable to half knowledge. Schroeder had from other signs come to the diagnosis of an ovarian cyst, but wanted to make it sure by the examination of the fluid just then so warmly recommended by Spiegelberg. It was found dark-brown, viscid, ropy, so rich in albumen that it coagulated entirely by heat. Specific gravity 1020. It contained paralbumen. So far everything looked like ovarian fluid. But then it was found that the fluid, having been exposed to the air for about twenty-four hours, cloudy coagula formed, which slowly sank towards the bottom. Recourse was had to the microscope, which showed the coagula to be fibrin, and failed to reveal any columnar epithelial cells. This spontaneous coagulation and absence of the cells characteristic of ovarian fluid was interpreted as a proof that the tumor was not ovarian, but a uterine fibro-cyst. It appears from earlier parts of this paper that the epithelial cells may be absent from true ovarian fluid and that this slow coagulation is not that characteristic of uterine fibro-cysts.

¹ Krause, in *Archiv für klinische Chirurgie*, vol. vii., p. 222, 1865.

² Gorup-Besanez, l. c., p. 525.

³ Simon, in *Berliner klinische Wochenschrift*, 1869, p. 234.

⁴ Röhrig, in *Arch. für klin. Med.*, vol. xvii., p. 357.

To entangle the case still more, a small quantity of urea was found in the fluid. It was estimated at 0.05 to 0.1 per cent. This pointed towards hydronephrosis. It was declared impossible to arrive at a diagnosis, and no operation was performed. The patient died, and the autopsy showed that it was a cystoma of the right ovary, the pedicle of which was twisted three times. This case then teaches us that *a small amount of urea may be found in ovarian cysts*. On the other hand, we have just seen that the amount of urea in hydronephrosis may become very small.¹ Accordingly a small amount of this substance does not permit us to draw any conclusion, neither for the one nor the other of these two affections, while a large amount suffices to exclude an ovarian cyst. The microscope may solve the question. If flat epithelial cells are found in the fluid, as in Fränkel's case, it cannot be ovarian. If, on the other hand, columnar epithelial cells are found, it cannot be hydronephrosis. By these tests it will be possible to arrive at a diagnosis in almost every case. But it must be admitted that the case of Simon might leave the diagnosis a little doubtful, for we have seen that ovarian fluid may be devoid of all histological elements except a few granules which do not prove anything (case xxxiii.). The presence of *paralbumen* would not be sufficient to prove that the cyst was ovarian and not hydronephrotic, as shown by a case described by Schetelig.² The fluid removed by tapping weighed thirty pounds. It was viscid, moderately dark, slightly alkaline, specific gravity 1018. It contained very much cholesterin and paralbumen, besides chlorides and phosphates, no urea. Nothing is said about microscopical elements. It was thought to be ovarian, but the operation, followed by autopsy, showed that it was hydronephrosis.

Before leaving this topic we will add that Naunyn has found *allantoin* in an ovarian cyst.³

Wheeler,⁴ of Boston, has described a case of hydronephrosis,

¹ Péan (Tumeurs de l'Abdomen, p. 266) says that it may disappear altogether, and refers to Cooper Rose's case, but this was not hydronephrosis, but a renal cyst, and will be spoken of in that connection.

² Schetelig in Arch. für Gynäk., 1870, vol. i., p. 416.

³ Waldeyer in Archiv für Gynæk., Vol. i., p. 273.

⁴ Wheeler, in Proceedings of the Gynecological Society of Boston, 1871, vol. v., p. 202.

in which he says that the fluid had neither the odor nor the characteristics of urine. After death there was found a cyst containing seven quarts of a thin, yellow, inodorous pus. If the fluid was simple pus, of course no diagnosis could be based on it, but since neither chemical nor microscopical examination is mentioned it is doubtful if a more thorough investigation would not have revealed the character of the cyst in which the fluid was contained. I have seen ovarian fluid which looked like pus, but did not contain anything but columnar epithelial cells. Dr. Geo. Chesmore, of San Francisco, has made a similar observation (oral communication).

20. *Cysts of the Kidneys.*

The cysts of the kidneys commonly remain small and pass unobserved before the pathologist finds them after death. But exceptionally they may acquire such dimensions that they may resemble ovarian cysts. Foerster¹ has seen one as large as the head of an adult, and Béhier² found one which contained eight litres of fluid. Atlee reports two cases, the one (xli.) "resembling a unilocular ovarian cyst;" the other (xl.) if it had been in a woman would have presented "close resemblance to a multilocular ovarian cyst." Even the microscopical examination might have led into error. There was clinical evidence that the cyst opened into the ureter. The urine mixed with the cyst fluid was examined by Dr. Drysdale. "Under the microscope it was seen to contain plates of cholesterin, coagulated fibrin, blood-cells, oil globules, and great quantities of *granular cells which in appearance closely resembled those formed in ovarian fluid.*"³ This cannot surprise us when we bear in mind that some classes of the tubules of the kidneys are lined with columnar epithelium, that is to say, the same variety as that of ovarian cysts, and that these so-called cells are liberated nuclei, whose cell-body has been dissolved. Here, then, for the first time in this long investigation we meet with a tumor which be longing neither to the ovary nor to the broad ligament may contain the characteristic epithelial cell or its derivatives.

But this question of the epithelium of renal cysts needs still

¹ L. c., vol. ii., p. 497.

² Quoted by Péan, *Tumeurs de l'Abdomen*, p. 227.

³ Italics are mine.

elucidation. Foerster¹ says that they have pavement epithelium and so does Rindfleisch²—men who as pathologists ought to know. On the other hand, Péan³ says there are two kinds of renal cysts, urinary and serous, the first of which have the same kind of epithelium as the uriniferous ducts, *i. e.*, columnar; while the latter present the aspect of a serous membrane, “whose inner surface never exhibits the epithelial cells of the ducts.” This means probably that they, like all serous membranes, have pavement epithelium.

The physical appearance of the fluid varies much. It is sometimes found clear and amber-colored, sometimes bloody and clotty (Cooper Rose⁴), sometimes as a yellow or brownish gelatinous mass (Rayer⁵), or like *café au lait* (Béhier), or it may be milky or purulent (Rayer).

As to chemical composition, it appears from the just mentioned division into two classes, that sometimes the fluid contains urea and uric acid, and sometimes not. Cholesterin is very common, and sometimes albumen, leucin, and tyrocin are found. Besides, there is a small quantity of the salts usually found in the blood and animal fluids.

It appears, then, that, in the majority of cases, we will be likely to find either flat epithelium or a large amount of urea, both of which exclude an ovarian cyst, but that there may be cases in which the fluid is very like ovarian. Nevertheless the characteristic histological element, columnar epithelial cells, have never been found in the fluid taken from renal cysts.

Through the kindness of Dr. Noeggerath, I have obtained some fluid taken from a renal cyst (tapped case xxxii.). The tumor had the size of the uterus at eight months' pregnancy, and was taken to be ovarian. Dr. Noeggerath was present at the operation. It was a polycystic tumor of one of the kidneys. The fluid is one of the most interesting I have examined, and well apt to explain that some people declare the diagnosis of ovarian cysts by the character of the fluid to be an impossibility. It shows, indeed, that the characters upon

¹ Foerster, l. c., vol. ii., p. 497.

² Rindfleisch: *Pathologische Gewebelehre*, p. 460.

³ *Tumeurs de l'Abdomen*, p. 222.

⁴ Henry Cooper Rose, in *Med.-Chir. Trans.*, vol. li., p. 167, 1868.

⁵ Rayer, l. c., vol. iii., p. 508.

which most reliance has been placed, at least in this country are fallacious. But, at the same time, it proves that the diagnosis between renal and ovarian cyst can be made by aid of the microscope. The fluid was light-brown, gray, turbid, like coffee with much milk. Reaction feebly alkaline. The quantity at my disposal was too small to take the specific gravity. It was not at all viscid, which so dark ovarian fluid always is. It did not coagulate spontaneously, coagulated almost entirely by boiling, and the coagulum was redissolved by excess of boiling acetic acid, forming an opalescent fluid. Under the microscope, the resemblance to ovarian fluid was striking. The field was crowded with bodies which were entirely like Drysdale's "ovarian cells," my "nuclei with shining fat-globules." Besides these, were found some of the large Bennett's corpuscles represented in Fig. 5 *d*. There were also some epithelial cells in beginning fatty degeneration, much like those of ovarian cysts (Fig. 50). But here the resemblance stops. By paying closer attention to the smaller bodies, I found that they were of two different kinds. The majority were identical with the nuclei in fatty degeneration, which we find in ovarian cysts. A smaller number, but still a great many, were not nuclei, but cells, as proved by the existence of a distinct nucleus in their interior (Fig. 51). These cells were slightly angular, mostly 7 or 8 μ in diameter, but some as much as 11 μ . I take them to be the *epithelial cells we find in the convoluted and straight tubules of the kidney*. I compared them with the epithelial cell on slides containing nephritic urine, and found them exactly alike. These are *short* columnar, or, as Kölliker¹ has it, they approach only the columnar form, and are entirely different from those found in ovarian cysts, whose length is two or three times larger than their width, or still more (Fig. 4). There was not found a single long columnar epithelial cell. By examining the cells while they were tumbling over, their shape was plainly seen as that of an irregular polyhedric body, with no marked difference in the length of the different diameters. I saw only a single cell with double nucleus. Furthermore, there were found a few larger cells (Fig. 52), measuring 16 μ in diameter. The body was light-gray and entirely free from granules of any kind.

¹ Kölliker: Gewebelehre des Menschen, 5te Aufl. Leipzig, 1867, p. 498.

Each had a nucleus measuring $8\ \mu$ in diameter, and containing small black dots and clear globules. This nucleus was identical with those swimming free and forming the majority of the corpuscles. The origin of these is then easy to understand. The epithelial cells of the kidney becomes edematous, their nucleus undergoes fatty degeneration, the body is gradually dissolved, and the nucleus remains.

The fluid contained small yellowish-red, rhomboid or barrel-shaped crystals of uric acid (Fig. 53). It contained also quite a number of bodies of a beautiful orange color, resembling threads, always ending in a pretty little brush. I have no idea what this can have been. It was not like any crystal I know of, nor cotton, linen, woolen, or silken fibres, but I suppose anyhow that it was some accidental admixture.

It contained, furthermore, irregular masses with a fatty appearance, like paraffin, but of a greenish color, and, finally, very small circular bodies with a clear centre, sometimes with a



FIG. 50.



FIG. 51.



FIG. 52.



FIG. 53.

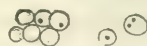


FIG. 54.

FIG. 50.—Epithelial Cells in Fatty Degeneration from Renal Cyst.

FIG. 51.—Epithelial Cells from Uriniferous Ducts.

FIG. 52.—Edematous Epithelial Cell from Renal Cyst.

FIG. 53.—Crystals of Uric Acid.

FIG. 54.—A Kind of Coccus?

granule or two, but never with any trace of a nucleus. They were rather like oidium (Fig. 54). They were smaller than red blood-corpuscles, colorless, and without central depression. I suppose this was some kind of microbion.

On addition of *acetic acid*, the nucleus of the epithelial cells of the kidney became more distinct. The free nuclei in fatty degeneration were scarcely changed by it.

Ether mixed badly with the fluid. It seemed to dissolve the cells. They became more transparent, less distinct, some barely visible. But in many, both large and small, the round clear globules and black dots remained.

This fluid, then, differed from ovarian fluid by the presence of epithelial cells characteristic for the kidneys, and of uric acid. Dr. Mettenheimer, a practical chemist of this city, examined a sample for me, and reported that it showed the reactions characteristic of *urea*.

This manuscript was already in the printer's hands, when I had the good fortune myself to see a myxo-fibromatous renal cyst extirpated by Dr. Thomas (operative case lviii.). The solid part weighed six pounds, the fluid five and a half pounds. A detailed description of this interesting case will be found in the Transactions of the New York Obstetrical Society (*New York Medical Journal*, February, 1882, pages 186 to 188). It was supposed to be ovarian before the abdomen was opened. Mere inspection of the fluid, as it flowed from the canula, was enough to satisfy me that it was not ovarian. It was reddish-yellow, clear, watery, like concentrated urine; it had no odor, did not coagulate spontaneously, became solid by boiling heat, the coagulum remaining unchanged in excess of boiling acetic acid. The specific gravity was 1022. On standing, the fluid separated into three zones: a thin layer of blood at the bottom, a thick cloudy layer in the middle, and a perfectly clear urine-colored at the top. The microscope revealed a great amount of red blood-corpuscles, small polyhedral cells undergoing fatty degeneration, like Bennett's large corpuscles, but considerably smaller, large, empty flat cells, shreds of connective tissue, no Drysdale's corpuscles.

(To be concluded in the next number.)

A CASE OF HYDROCELE IN THE FEMALE.

BY

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THE extreme rarity of this affection renders it advisable that every case coming under the observation of physicians should be reported. For this reason, I offer mine as a contribution to our meagre literature in this department. In a more extended article on this same subject by William C. Wile, M.D., which appeared in the *AMERICAN JOURNAL OF OBSTETRICS*, July, 1881, he quotes from Thomas on diseases of women, giving the descriptive and pathological anatomy of hydrocele in the female, and adds: "I understand too late to

consult the work that Goodell mentions it in his *Lessons on Gynecology*." As there is so little reference made to the subject in our text-books, I take the liberty of quoting the following from Goodell:¹ "This affection is analogous to the encysted hydrocele of the cord in the male, and consists of a collection of fluid in a serous sac around the round ligament. It is due, as in the male, to an imperfect obliteration of the peritoneal prolongation which invests the round ligament from each internal ring through the inguinal canal to the upper third of each labium majus. This obliteration begins at the two ends, the ring and the labium; and, if it is incomplete, a sac is formed by the unobliterated space. Fluid collecting in this sac forms an oval tumor, which, as it occupies the site of an inguinal hernia, greatly resembles it. The fluctuation, the dulness on percussion, the translucency, and the history of the tumor should generally discover its character."

The report of my own case is as follows:

Patient married, æt. 22, two months pregnant. For about two years she had noticed an enlargement of the right labium majus. It first appeared near the menstrual period, after unusual exertion, and a cold contracted at that time. It had troubled her at times since, and occasionally had been a little painful; but more inconvenience was felt from a sense of weight and fulness in the part.

She had once consulted a surgeon; but, as she was unwilling to have an examination, he gave no positive opinion, but thought it probably a hernia. About two weeks before presenting herself to me for consultation, this enlargement increased; and though she occasionally had slight pains from it, the greatest trouble was the inconvenience in sitting, and her remark was: "It is just filled with water." On examination, Nov. 13th, '81, I found a tumor about an inch and a half (four centimetres) in length, with no redness or induration surrounding it, and filled with clear serum, or some translucent fluid. On the posterior wall of the sac could be distinguished something extending nearly the whole length of the tumor, increasing in diameter from above downwards, and terminating in a bulbous extremity.

Neither fluid nor other contents could be returned into the abdomen.

I had never seen a similar case; and I should have been troubled to diagnose it, had it not been for the cases reported by Dr. Wile, already referred to. With this aid in diagnosis, I felt sure that I had a case of encysted hydrocele of the round ligament; but as I wished time to consider and to re-read the article above quoted, I prescribed an anodyne ointment, and told the patient to report

¹ Goodell's *Lessons on Gynecology*, p. 85.

in about two weeks. In a few days (Nov. 22d) I was sent for, and found tumor enlarged to double its former size, and still presenting the same translucent appearance, with no surrounding redness or induration. I considered my diagnosis confirmed, and prepared to operate. Owing to my patient's pregnant condition, and fearing an injection of tr. iodine might cause much pain, as well as being uncertain as to the amount of inflammation it might give rise to, I operated slightly differently from the method chosen in the cases so far reported.

I inserted the point of my curved bistoury into the most dependent portion of the tumor, so as to make an incision about one-eighth of an inch in length, and allowed the contents to flow out. About two and one-half ounces of perfectly clear serum passed; and now this cord-like projection before spoken of could be rolled under the finger, and traced distinctly to the upper border of the labium.

After evacuating all the serum, without compression being made, I injected the sac with a dilute solution of carbolic acid, about one part in fifty, and applied a compress of medicated cotton, which patient was to change as needed. The next day I introduced a bistoury through the same incision, and, perhaps, a 3 ss. of serum was discharged, and I again injected the sol. acid. carbol. Patient had had less pain than before, no fever since the operation, and had taken no medicine whatever. I repeated the injection twice more, on the 24th and 26th. On the two last occasions, I could obtain but a few drops of fluid from the sac. The right labium was still larger than the left, though no difference was noted unless the parts were distended; what I had diagnosed as the round ligament had decreased, till it felt like a small-sized cord under my fingers. I discharged my patient on the fifth day after operation, saying I would call and examine the case in about two weeks. At that time (Dec. 10th), I found there had been no refilling of the sac, my patient had been able to do her ordinary work, and I congratulated myself on my successful operation. On Dec. 14th, the lady presented herself again at my office, and said it had pained her somewhat for a day or so, and had slightly enlarged. On examination, I thought the sac contained about 3 ss. of fluid; and supposing that it would increase, I agreed to operate in two days. On conferring with Dr. Robert Boal, of Peoria, Ill., in regard to the case, his judgment coincided with mine as to the use of a seton, and I went Dec. 16th, prepared to operate in this manner. I found, however, my patient much better, sac decreased in size, apparently containing not more than three or four drops of serum. I did not operate, but applied the following solution, on compresses of medicated cotton: R Ammon. muriat., 3 ss.; Spts. vini, fl. ʒ iiij.; Aquæ, q.s. ad fl. ʒ vi. M.

Jan. 9th, '82.—I again examined patient. She used lotion only two or three days. There has been no refilling of sac. The right labium is still somewhat the larger, and of slightly bluish tinge.

Feb. 11th, '82.—Condition of patient same as when last reported.

A CASE OF RUPTURE OF THE LOWER SEGMENT OF THE
UTERUS AND OF THE VAGINA.

BY

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WITHIN the last year or two, several articles have appeared in this JOURNAL upon the subject of rupture of the uterus, the perusal of which afforded me a great deal of interest and instruction. A similar case fell into my hands recently, and as it is well to have all such cases placed upon record, I send a history of the same, as taken from my case-book.

On Thursday, December 23d, 1881, at about 1.30 P.M., I was requested to visit Mrs. McP——, who was said to be in labor, and in a very low condition. When I reached the house, I found that the patient was in an adjoining room. When she entered the bed-room, where I was awaiting her arrival, I was struck by her peculiar appearance; she seemed to be exsanguined and with protruding eyeballs. I immediately got her into bed, and then elicited the following history: She is about thirty-five years of age, Irish, has been confined eight times before, one of which was a twin confinement, and all of them normal; she thinks that she has gone over her "time" in this confinement. On Tuesday, the 21st inst., about 5 A.M., she was taken in labor; the labor continued "hard" until 10 A.M. (there was a midwife in attendance), when the pains ceased abruptly, and instead of labor-pains, there appeared pains of a different character altogether, and which were continuous up to the present time. Some of those (females) who were with her at the time noticed that she had assumed a different shape. The midwife, previous to the ceasing of the pains, told her that "the head was there ready to come." As soon as the labor-pains ceased, she was taken with quite a profuse hemorrhage, and the bleeding has continued ever since.

On auscultating the abdomen, I failed to hear the fetal heart; I could, however, outline the child through the abdominal walls quite readily—it was on the right side. I then passed my index-finger into the vagina, but on passing it about failed to recognize matters as they should be. I then passed in my whole hand, and examining anteriorly with my finger, I felt something that appeared as if there was an immense growth from the pubic bones; it was not firm enough to suspect a bony or cartilaginous growth—indeed, it was hardly as firm to the touch as a fibroid. I then introduced my hand still further, when I came in contact

with the placenta. I could, apparently, circumscribe it, and made an attempt to withdraw it, but it was held firmly. I then let go the placenta to investigate further, when I got hold of something that felt very much like an unusually loose bag of waters; I began to gather it up between my thumb and index-finger, when I found that I soon had it circumscribed, and between the tips of my thumb and index-finger I recognized that I had mesentery. I immediately divined what I had to deal with; the tumor lying behind and above the pubis was the uterus emptied of its fetus and placenta; the child out of reach in the abdominal cavity; the placenta partly in the vagina and partly in the peritoneal cavity, and that I had a coil of intestine between my fingers. I removed my hand, informed the husband of the gravity of the case, and sent immediately for assistance.

While the husband was after assistance, I took her temperature and examined the character of her pulse; the former was only 96° F., while the latter was 144 to the minute, small and thready.

In a short time, a professional friend came to my assistance. I explained to him the condition of affairs, when he made an examination, and was satisfied that the child was in the abdomen of the mother. I then passed my hand and forearm into the vagina and through the rent, and after pushing aside the intestines came in contact with the head, which was lying in the right iliac fossa, the abdomen and lower extremities of the child lying vertically against the abdominal walls of the mother. With my left hand on the outside steadying the child, I succeeded in getting hold of the right foot, and gradually drew it down until it presented at the ostium vaginae. The other foot did not follow, however, and it was necessary to reintroduce the hand and arm to secure it. After getting down both feet and the body, the right posterior hand was delivered, and then the left. It was in delivering the head that we experienced the most difficult task. Although we could get our fingers into the mouth (the child was dead, of course) and upon the superior maxillary and malar bones, with the body lying over the abdomen of the mother, we could not, for some reason or other, swing out the face. We finally delivered it by dropping the body downward and making traction in that direction. The placenta, by manual efforts, followed the child. The reason it could not be delivered in advance was that the funis, being still attached to the child, prevented.

Although stimulants and opium were given, the patient died about eight hours after delivery—she never rallied from the shock from which she was suffering when first seen by me.

During the most of the time after the rupture occurred, there was an involuntary diarrhea.

As the husband would not permit me to hold a post-mortem, I declined giving him a death certificate, and referred him to the coroner. I requested that functionary to order a post-mortem, but my request was disregarded.

In this case, so far as I was able to make a diagnosis, it was a rupture of the cervix uteri on the right side, extending up to the vaginal junction; then, instead of continuing along the body of the uterus, it passed off into the vagina, and separated this organ from the uterus at its junction from right to left all along the Douglas cul-de-sac. The probabilities are that the rupture occurred when the *regular* labor-pains, over fifty hours before my connection with the case, ceased; the child was gradually forced into the abdominal cavity by the uterus, but the uterine pains were obscured to the patient by the shock and those "other pains" that the woman was unable to describe.

About an hour after the pains changed in character, a doctor was called in who made an examination, and stated that everything was all right; that nature would complete the labor; that the woman was simply exhausted, and was taking a rest. He then took a rest himself by leaving the patient. This same doctor, when testifying at the coroner's inquest, when pressed to give the position and presentation of the child, stated that it was "nearly a shoulder presentation." Now, if he recognized a shoulder presentation, and assured the friends that everything was "all right," he was a very great ignoramus, not to use a harsher term.

About 3 P.M. on the same day, another doctor was called. This second one stated that there was something wrong, but as he had some vaccination engagements to attend to, he could not stay, and went away.

Now as to treatment. I believe that where there is a rupture of the body of the uterus alone, the treatment to pursue, always, is the abdominal section, and had the above case been such a one, I would not have attempted to deliver *per vias naturales*. When there is a rupture of the vagina in addition to the same condition of the uterus, we have an entirely different state of affairs. When there is only a rupture of the uterus, the cleansing or drainage of the peritoneal cavity is out of the question without gastroto-my; but where there is a rupture of the vagina, drainage and antiseptic cleansing are possible, but the line of treatment is not so clear. I will not take up any more of your space, and will close with the following interrogatory: In such a case as the above, if seen early, would the patient have a better chance of recovery by abdominal section than by delivery *per vaginam*?¹

¹ This question is still *sub judice*, although, with the constantly increasing perfection of the methods of abdominal surgery, and the present

A SIMPLE OPERATION FOR CYSTOCELE.

BY

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MRS. A., a German woman of about thirty-two years old, mother of four children, came under my care for chronic cystitis in 1878. She had been attended by several physicians without relief. She had been treated for "ulceration" of the os uteri, canterized, and had worn a supporter. She had the urethra dilated and had used all kinds of diuretics. On examination, I found she had a pronounced case of cystocele, the distended vesicovaginal sac protruding between the labia. There was excessive tenderness to the touch and intense dysuria with strong ammoniacal urine. She could walk only with great difficulty, and generally sat on the floor all night in a squatting position, legs flexed and arms around the knees. She could not sleep from continual pain, and could empty her bladder only by pushing up the cystocele, so as to throw the urine back on a level with the urethra. She was sent to Louisville to be operated on by Sims' method, but returned after having been examined and pronounced unfit for such an operation, as she was in the primary stage of phthisis.

She suffered so much after her return, that I determined to give her relief if possible, and instead of operating after any of the methods described in the books, Sims, Emmet, or Stoltz, used this simple method, which gave her entire relief and cured her completely of the cystocele. I took an ordinary elastic tube, such as are used in nursing bottles, attached to the cystic end an elastic button, and to the external end an elastic bladder or urinal, which could be detached at pleasure. After having opened the cystocele with a probe-pointed knife, I put into the bladder the button-end of this elastic tube, and gradually withdrawing it, found the button to hold the tube in the bladder nicely. I then with an elastic band tied the urinal to the leg. This simple contrivance and operation kept the bladder perfectly free from urine. There was nothing, therefore, to keep up the irritation of the vesical mucous mem-

very small rate of mortality after ovariectomy, it is exceedingly probable that laparotomy will ere long become the rule in cases of rupture of the uterus with escape of the whole or larger portion of the child into the abdominal cavity. Dr. Harris (AMER. JOURN. OF OBSTET., Oct., 1880, p. 803) gives sixteen per cent as the ratio of recovery from rupture of the uterus and delivery through the vagina, compared with twenty-one recoveries out of forty laparotomies for rupture (55%). The author is referred to the articles of Dr. Wenzel in this number, and of Dr. Harris, for a full answer to his question.—Ed.

brane, no degenerated or ammoniacal urine, no pressure from within to distend the vesico-vaginal wall forming the cystocele. I used on the vesico-vaginal wall or cystocele the oxide of zinc ointment. The tube was allowed to remain about four weeks. At that time the cystocele had entirely subsided, and the vesico-vaginal wall was normal. She could pass her urine by the urethra without pain. Injections through the urethra came out of the tube and *vice versa*. I used for a while injections of warm water and chlorate of potash, and gave internally, fld. ext. triticum repens and potass. bitart., but soon ceased using anything but the warm water, as the patient did not require anything. The tube gave the bladder complete functional rest, and all cause of pain and distention being thus removed, medication seemed to be unnecessary. The tube was easily removed, and after its removal there was no fistula, and not a drop of urine passing through the vesico-vaginal walls. She could urinate freely and without pain. She lived about a year after the operation and died from phthisis.

The operation is so simple, and in this case has been so successful, that I hope some one else will try it. It seems to me to be the only rational method of cure yet proposed for this affection, and is particularly applicable to cases where a plastic operation is refused or impracticable for domestic reasons.

A CASE OF PRESENTATION OF THE HAND, FOOT, AND FUNIS.

BY

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A PAPER ON "The Presentation of the Head and Feet," by Henry G. Landis, A.M., M.D., Professor of Obstetrics, etc., in Starling Medical College, Columbus, Ohio, in the January number of the JOURNAL, recalls to my mind a case of this kind, and the only one that has occurred in my practice, complicated with a presentation of a loop of the funis also, which I desire to add to the recorded cases of complex presentations. This was my nine hundred and thirty-fifth case of labor, not counting abortions. Among this number there were eight cases of placenta previa, six of hand by the side of the head, and two of funis at full term, showing in my experience the

presentation in question to be the least frequent of any of the complex presentations.

The record of my case is as follows:—

“September 11th, 1877.—Called in consultation to Mrs. McL—, an Irish woman, of stout figure, in her fifth pregnancy and at full term. She had been in labor nearly twenty-four hours; was exceedingly restless and somewhat exhausted. The membranes had ruptured several hours before. Upon a digital examination I found a head, one foot, and a loop of the funis tightly jammed down into the cavity of a capacious pelvis. The vertex was presenting, with the occiput forwards and the foot and funis backwards. The cord was pulseless, and the child dead. After putting the patient under the influence of chloroform, I grasped the foot with one hand and made traction; at the same time pushing upwards with the fingers of the other hand upon the head, but failed to produce any movement of the child towards version. I then applied the forceps, and delivered with little difficulty; the foot receding as I drew down the head. The child was a male, weighing ten pounds. The mother made a good recovery.”

In this case, turning, the method of delivery usually recommended by the authorities, failed, but it is fair to state that it was not a favorable case for version, because the liquor amnii had been drained off for a considerable time, and it was a dead child, of large size. It certainly is not wise to lay down any definite rules of management for cases so rare. The obstetrician, who has the many resources of his art at command, and good judgment, will be the oftenest successful, if he relies upon these, rather than upon authorities, and sometimes, after all, his efforts will of necessity be tentative. I venture to dissent, in some slight particulars, from the conclusions arrived at by Professor Landis, with hesitation, because his experience is greater than mine. First, I do not consider that in such cases as mine it would make any appreciable difference in the risk to the mother, whether delivery is accomplished by version, the forceps, or craniotomy, and in this instance delivery was effected more easily and speedily than it could have been by craniotomy. Besides, the child was not mutilated, which is always desirable to avoid, unless necessary. The doctor says, “The application of the forceps, after failure to turn, would seem to be clearly needless.” It would *not* seem so in my case. I would then make the suggestion, that his amendment of the procedure of

Cazeaux be amended thus: first, to replace the prolapsed members, if possible; second, if not, to make moderate efforts to turn; third, if this cannot be accomplished readily, to apply the forceps; *fourth*, after failure thus far, lastly to perform craniotomy. I would make an exception to this, in cases of mento-posterior face presentations; here I should consider it impossible to deliver with the forceps, or only possible by the use of a degree of force not justifiable, and would place craniotomy third and last in the order. The principal reason why I would deliver with the forceps rather than perforate, even in cases of dead children, is because of the strong repugnance that usually exists in the feelings of the friends to the mutilation of the child, and because the practitioner exposes himself to the risk of being charged, though it be unjustly, with malpractice. Of course, this repugnance is a sentiment only, but one which, in my opinion, we are bound to respect always, and comply with the demands of, whenever there is no sufficient reason for doing otherwise.

The doctor remarks truly that it is, "the tendency of complicated labors to be very complicated." Two out of his three recorded cases were complicated with placenta previa, central, and two out of three cases of central placenta previa, that have occurred in my practice, were complicated with shoulder presentations of the child.

AN AGGRAVATED INSTANCE OF MASTURBATION IN THE FEMALE.

BY

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Washington, D. C.

THE following case recently came under my notice and is communicated both as an aggravated example of the vice in question, and for the purpose of briefly discussing its frequency, causes, and treatment:

Miss H., a nervo-sanguine young woman of twenty-two years, small and delicate in stature, with brownish-red hair, and unstable, nervous temperament, consulted me not long ago for numerous anomalous nerve pains, with bearing-down, rectal and vesical tenesmus, headache, melancholia, defective eye-sight, and a long

train of sympathetic disturbances. She complained of a pricking sensation in the clitoris, aggravated by contact with her drawers, or even by the sheet. After much entreaty, she allowed an examination. I found a three-inch clitoris, highly congested, with extreme turgidity of surrounding structure. The fundus low down and the cervix enormously elongated and almost protruding. The examination was most embarrassing, as the least touch provoked the most intense orgasm that I have ever witnessed. Her condition at such times was almost epileptic, and she seemed lost to all sense of shame or decency, using her own hands to intensify the erethism. The glands of Naboth became turgid and threw out a profuse amount of viscid mucus, the cervix drew itself in, like the suction of the mouth, and the clitoris erected itself, like its male analogue. Much expenditure of sympathy, and a strong assertion on my part that it was absolutely necessary, disclosed the following history. She had been a confirmed masturbator from twelve years old. Usual means, after a while, failing to give the desired relief, she resorted to constant attrition against the cervix, either with a rubber imitation of the male penis, or with the finger of a female friend. This also failing to relieve her, she or her friend would seize the cervix, squeeze and pull it, and the more forcible the action, the more intense was her satisfaction. At the same time that her friend was thus engaged, she would also irritate the clitoris, until by its erection she was able, with it, to give a reciprocal pleasure. Thus she and her friend lived, gratifying each other, until they had both lost all desire for men, and were reduced to a condition of complete mental irresponsibility. They were in the habit of gratifying each other several times during the day, and between times she would herself bring about the orgasm. Her moral nature is *nil*, and while she has never received the embraces of men, she is a demon of sensuality, not hesitating to masturbate herself upon the table, or in the chair while relating her history.

In commenting upon the case, Dr. Mundé advised for treatment "amputation of clitoris and cervix, natural gratification of the sexual passion (marriage), and a proper moral and physical atmosphere (apart from her 'friend')." The use of a distinct, scientific phraseology, without redundant sensationalism, in the discussion of this erotic subject, is more or less difficult, yet the matter is one of so much interest, involving so many lateral considerations, and has been so insufficiently written about, that it is worthy the attention of every one. That strange moral inconsistency which delights in the ignoble action, but is stubbornly silent in detailing it, renders a history of such incidents exceedingly meagre. Gynecologists are aware that masturbation is a fruitful source of uterine disease, and superintendents of insane asylums admit that to this cause may be attributed a

fairly large percentage of female insanity. The especial physical features in the case just detailed are the hypertrophic elongations. The intra-vaginal cervical elongation, although denied by Emmet ever to exist, was made the more evident by the measurements made in the dorsal decubitus and in the knee-breast position (as advised by Mundé). The enlarged clitoris is occasionally met with, and many cases of extreme hypertrophy are on record. Prolapse of the womb from supra-glandular elongation (Goodell; the distinction he draws being a good one), *i. e.*, the isthmus and lower portion of the corpus, is also a common event, but whether due to true hypertrophy or not, is a question which I have not yet been able to solve. The free extremity of the terminal fibres of the vagina which "gird it at the middle third of its glandular portion," is the generally accepted definition of the intra-vaginal portion of the cervix, and hence it is easy to see why there was no apparent rectal or vesical prolapse in the case of Miss H. In supra-vaginal elongation, there is always vesical prolapse due to traction, and if it be true that a supra-vaginal hypertrophy necessitates an equally prominent infra-vaginal hypertrophy, then it may be admitted that these are not cases of true hypertrophy, because they rarely, if ever, co-exist. The ground taken by Goodell seems to me to be sound, that these cases are not primarily hypertrophic, but due to traction and to a stasis of circulation, and that the increase of growth is secondary. The true pathology of these elongations is full of interest, and the final solution has not yet been reached.

It is more consonant with the purpose of this article to discuss the causes of masturbation than to describe physical conditions. It seemed evident to me that there was a well-marked intra-vaginal elongation with some prolapsus, and that this was due to a persistent traction. The primary factors in the causation of this pernicious habit are psychic and physical. The psychic may be subjective or objective. Subjectively are: 1st, the tainted conditions of heredity; 2d, mental views, distorted though they may be, verified by an equally distorted consciousness. This was the case with Mad. de Warrene whom Rousseau describes so graphically. 3d, An internal propensity. Objectively are: 1st, Subjective states of mind when persistently dwelt upon. 2d, The moral degradation of nurses. 3d, The exciting conditions engendered by civilization, *i. e.*, unhealthy associations, unhealthy reading, unhealthy and stimu-

lating diet, unhealthy ventilation, the free license of the drama, the close contact of the waltz, and the manner of dressing. 4th, Want of proper physiological knowledge. Among the physical causes are those that are cerebro-spinal, cerebral only, or those affecting different parts of the sexual apparatus, and ascarides. The psychic and physical causes will be considered in general, as their detailed elaboration would occupy more space than I am entitled to. In a certain sense it may be asserted that we are processes of heredity, and are evolved from antecedent states and conditions of being. Not infrequently does it happen that a child is born with a predominance of the sensual over the moral, and instances of wonderful youthful precocity are not rare. This tendency to an exaltation of the animal passion may be enhanced by a similar condition in one parent or in both, which permeates all of the associations and surroundings of the infant. The natural outcome is a laxity of high principle, a comfortably weakened will, and a moral law enacted to suit the general desires and appetites. Frequently there is added to this infected atmosphere the care of a nurse, who, to soothe the irritability of the baby, will indoctrinate her with the habit of masturbation, by first using her own hand and then permitting the child to gratify itself at will. This is, perhaps, the most universal cause. A habit thus inaugurated in infancy, in a child, the victim by inheritance of a strongly animal nature, becomes in adult life a moral necessity by a specious manner of subjective argument. The original concept was never wrong, because almost co-eval with the child. The adult conception which, in a healthy mind, would have demonstrated the moral and physical sin of the act, has never obtained because the false mental view formed in childhood, which saw no sin in the habit, but rather a strong defense against the actual commission of fornication, has grown each year more strong, until, by repetition, a lie seems to be the truth, and this mental aberration will be confirmed by a consciousness equally stunted in growth. The woman, whose moral nature has been warped from her earliest days, will argue to herself, that there is no possible harm in masturbation, but that it keeps her from being unduly familiar with men. Again, some women are the victims, from birth, of a highly sensitive and hyperesthetic nervous temperament, and the least exciting cause is sufficient to upset them completely; with them masturbation is a disease of the nervous system, and should be

treated as such. The persistent contemplation of a subjective state of mind, becomes, objectively a cause of masturbation. This state of mind may be engendered by a course of pernicious reading, and when dwelt upon exceedingly, creates the longing that is consummated in self-abuse. The sensualism of a civilization, characterized by the luxuriousness of wealth, has done more to lower a high moral tone among women than any other factor I know of. Apart from the richly seasoned condiments of the table, that stimulate every function, apart from the soft sensuousness of perfumed apartments, thickly covered with softest carpets and draped with richest hangings, apart from the warm rooms and late hours, there pervades society in all its ramifications a license of speech, of dress and of intercourse, which tend to break down the barrier of reserve which a modest maiden never forgets. The books that are read, the plays and operas that are listened to, the dresses that are tolerated, and the dances that are indulged in, are highly conducive to uterine congestion. Dr. Goodell has so ably exposed the harm of long engagements that I need not dwell upon this point. Of physical causes in the child, perhaps the most frequent is the seat-worm. *Ascarides*, together with a want of cleanliness, set up an irritation that is only relieved by friction. In adult life, we have, as frequent irritants, pruritus vulvæ, congestion of the ovaries, ichorous discharges from the vagina, erosions of the cervix, and an elongated clitoris. Cerebro-spinal irritation is another cause which may not be lost sight of. The sexual desire seems to be more marked in certain temperaments than in others, especially in thin, sallow nervous women.

Of the treatment little need be said. The cause, if physical, must be alleviated. The system must be built up by tonics, and the nerves quieted by bromides. An unusually elongated clitoris should be amputated, and in certain conditions oöphorectomy is indicated. The moral surroundings of the patient must be looked to. She should be instructed, intelligently, as to her condition, and should be removed from all associations and surroundings that aggravate the case. She should be brought into intimate communion with pure, strong minds, and should have the benefit of a bracing climate, with rigorous out-of-door exercise. She should also be interested in some occupation or employment that will amuse her, and should take up a course of reading that will elevate her mind. At such a time as is possible,

she should marry and have natural sexual gratification. Many cases are hopelessly incurable. The will has become so weakened that chronic insanity results. In others, there is a moral insanity in regard to the pure relationship of the male and female, though in every other particular the woman is perfectly sane. The general cultivation of a higher relationship among the sexes, the dissemination of sound physiological knowledge, not calculated to pander to corrupt tastes, and the purification of social habits and customs are, after all, the most potent medicines in the treatment of this habit, so disastrous in its results, so subversive of physical and moral life, and so prevalent among girls.

DENOMINATION OF THE OBLIQUE PELVIC DIAMETERS.

BY
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IN my review of Dr. Lusk's "Midwifery" (see SUPPLEMENT, March, 1882, p. 88), I said erroneously that it was the uniform usage to name the oblique diameters of the upper aperture of the pelvis after the sacro-iliac joint from which they start. This was a mistake which I hasten to correct. The statement was scarcely in print before, in discussing a case in the Maternity Hospital, I found that the physicians attached to my service had been taught differently in different schools. I, therefore, resolved to pay closer attention to this subject.

Having examined the treatises on obstetrics in my own possession and those found in the library of the New York Hospital, the largest medical library of the city, I have come to the result that many authors, and especially among the oldest, such as Deventer, Denman, Delamotte, Smellie, Guillemeau, do not contain anything on the subject. Secondly, I have found ten authors who count the diameter in question from its anterior end, namely: in France, Baudelocque, Capuron, Cazeaux, Meygrier, and Tarnier; in Great Britain, Blundell, "Edinburgh Practice," and Murphy; in America, Bedford and Hodge.

On the other hand, I have found eighteen authors who take

the sacro-iliac joint as starting-point, and use the expressions left and right in reference to this joint, namely: in France, Chailly, Velpeau, Jacquemier, and Joulin; in Great Britain, Aitken, Rigby, Ramsbotham, Churchill, Leishman, and Playfair; in America, Davis, Meigs, and Tucker; in Germany, Schroeder, Siebold, Naegele, and Spiegelberg.

It is, of course, somewhat arbitrary what we will call the right and what the left of an ideal line, of which one-half lies in the right and the other in the left half of the body, and it might even be said that it would come more natural to us to name a thing after its anterior than after its posterior end. But there are very weighty reasons why it is desirable to designate the oblique diameter as "right" or "left," according to the sacro-iliac joint. Everybody will admit that the confusion is inconvenient, and that we should try to obtain unity in this respect.

The oldest book in which I have found the subject mentioned is the work of John Aitken, published in 1784, and he takes the sacro-iliac joint as starting-point.

If we can go by the number of works consulted, there are nearly twice as many who use the sacro-iliac joint as starting-point as of those who start from some point on the anterior wall of the pelvis.

It is more difficult to weigh authors than to count them, but, at all events, the list of those who designate the oblique diameter in reference to the sacro-iliac joint contains some of the greatest obstetricians the world has ever known.

The two text-books which have been most used in this country of late years, those of Leishman and of Playfair, both use this terminology.

Hundreds of young American physicians spend more or less time in Europe, in order to enlarge their stock of knowledge before they start in practical life. Since some years, Germany and Austria are the countries preferred, and obstetrics are a branch of science in which a great many seek practical instruction, but now, I do not think, there is a German clinic in which the terms in question are used otherwise than I advocate.

Finally, the committee appointed by the Obstetric Section of the last International Medical Congress, in order to bring about conformity in the obstetrical nomenclature of the different countries, has recommended, among other things, to draw the oblique

diameters from the point in which the ilio-pectineal line intersects the sacro-iliac joint to the ilio-pectineal eminence, the point in which the iliac bone and the pubic bone join one another in the ilio-pectineal line, and to call the one running from the right side posteriorly to the left side anteriorly, the right oblique first, because the sacrum forms the base of the pelvic ring, and, secondly, because the fetal head, in the great majority of cases, lies with its antero-posterior diameter in this diameter of the pelvis.

A DIFFICULT FACE CASE, COMPLICATED WITH SHOULDER
DYSTOCIA FROM AN UNUSUAL POSITION OF THE ARMS.

BY

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THE patient was in her ninth labor; the face presented in the transverse diameter at the brim. When first seen by me, the labor had gone on for eleven hours, the os was dilated, the membrane unruptured, and the head had not engaged. Rupture of the membrane, which followed in half an hour, was succeeded by the engagement of the face in the transverse diameter and with chin to right side. During the succeeding pains the chin rotated backwards to the right sacro-iliac synchondrosis, and with the view of preventing further rotation backwards, or if possible rectifying the position, forceps were applied without, however, much benefit beyond the production of a certain amount of descent into the cavity.

The patient was left for seven hours to natural effort, and, no progress being made during that time, Professor Russel Simpson's "axis traction" forceps were applied, and delivery was readily effected, the face passing into the transverse and being delivered in that diameter. After the head was fairly born, much difficulty was experienced in effecting delivery of the shoulders. Under the combined influence of pressure on the uterus and gentle traction on the head of the child, the face rotated half round the pelvic circumference, and at the same time the shoulders came down to the pelvic floor in the conjugate diameter. It was then found that the arms were lying parallel

down the back of the child in a state of complete dorsal extension. The child gave a few gasps after birth, but all efforts at resuscitation proved unavailing. The child weighed ten and a quarter pounds, and the cranial diameters were on an average half an inch above normal.

The deductions to be drawn from this case are briefly the following:

1. The causation of the malpresentation is to be sought for in the fact that the greater breadth of the bi-acromial diameter would interfere with the descent of the sternum on the chin, and so interfere with the normal tendency to flexion in the uterus. The impaction was also due probably to the same cause preventing the descent of the shoulders after labor had set in, though the greater size of the head may have had to do with it in some measure.

2. The position of the arms was a condition existing before the onset of labor. It probably arose during the early months of pregnancy, by the arms slipping down during some of the fetal movements, and by their compression by the uterine walls against the trunk of the child, and their ultimate slipping back on to the dorsum.

This position of the arms, while rare (not having been described), has some important practical bearings.

1. The shoulder dystocia resulting was probably the cause of an amount of delay, which resulted in the loss of the child.

2. It may have been the primary cause of the malpresentation.

3. In relation to turning, it was of importance; for, most probably, had the operation been attempted, much difficulty would have arisen by the hitching of the arms.

In reviewing the treatment adopted, a word may be said in defense of the use of forceps in the early stage of the case, on the ground of their being employed, not as a means of immediate delivery, but as a means of rectifying the position. The necessity of the forceps in the later stage was indicated by the want of any progress in the labor, and the efficacy and adaptability of the instruments used were proved by the rapid and satisfactory mode in which they effected delivery in so difficult a case as an impacted face.



Dr. Otto Spiegelberg

H. Bencke Lith. N.Y.

OBITUARY.

OTTO SPIEGELBERG.

(With Portrait.)

ON August 9th, 1881, at 6:30 P.M., occurred in Breslau the death of a man whose name was known and esteemed all over Germany, and far beyond its limits: Otto Spiegelberg, the celebrated teacher, has passed away. It behooves us to briefly present to his cotemporaries the life and activity of the man who, as writer, teacher, and physician, has in many respects acted as a reformer and investigator in obstetrics and gynecology. Born on January 9th, 1830, at Peine, in Hanover, he went to the Gymnasium at Hildesheim and the Carolinum at Brunswick. When seventeen years old, he studied at the University of Göttingen, attended the lectures of von Langenbeck, Fuchs, von Siebold, and others; received his degree in 1851; passed some time in Berlin, Vienna, and Prague; settled in Göttingen in 1853 as lecturer of obstetrics, and became assistant to E. C. J. von Siebold. In 1855, he made a prolonged tour through England, Scotland, and Ireland, which had a lasting effect upon him, and was the cause of a permanent predilection for English institutions. The observations he made there, he submitted to his German colleagues in the form of a very interesting article: "Zur Geburtshülfe in London, Edinburgh und Dublin" (Obstetrics in London, Edinburgh, and Dublin; *Monatsschr. f. Geb.*, 1856). Otherwise, he was at that time chiefly engaged in physiological and anatomical studies, the most noteworthy of which are: "Experimental Investigations of the Nerve-centres and the Movements of the Uterus," and investigations into the mechanism of labor. Aside from these, owing to his excellent powers of observation, he had gathered so much practical experience that he, when only twenty-eight years of age, in 1858, was able to write a text-book of obstetrics—a work which was then very favorably received, and is to-day yet of great value. About Easter of 1861, he accepted a call to Freiburg, in Baden, as professor of obstetrics, having been shortly before appointed

professor at Göttingen. He remained in Freiburg until October, 1864, when he settled in Königsberg. Besides his many literary labors, he developed at this time considerable activity as an instructor. He could do both to still better advantage when he was called to Breslau in October, 1875. Here, too, he was uninterruptedly active as a writer. Nearly every important medical periodical contained articles by him, and every essay of Spiegelberg's could be certain in advance of the interest of the reader. The *Berliner klinische Wochenschrift*, among others, contained many valuable contributions by him, and he always had a high opinion of the influence of that journal. He grappled with nearly every clinically important subject, and every matter to which he turned his attention was sure of a profitable settlement. Moreover, he also incited others to activity, and the number of the contributions of his students is an imposing one. Undoubtedly his strictly scientific bent was to a great extent instrumental in raising obstetrics more and more above the level of the art of the midwife, and directing it into scientific channels. While he had devoted himself until about 1865 chiefly to obstetrical themes in the clinical field, he thenceforth directed his best endeavors to operative gynecology, which had received an unexpected impetus from the successes of English and American operators.

Ovariectomy was especially attractive to him. Having materially elucidated the anatomy of ovarian cysts by thorough investigations, he contributed largely to the diagnosis of these tumors and to the perfection of this operation. For it was he who introduced one of the most valuable auxiliaries to the diagnosis of abdominal tumors in the exploratory puncture; it was he, too, who first recommended the dropping of the pedicle after ovariectomy, and who showed by experimental investigations that this could be done without injurious consequences. Besides, he showed a preference for the laborious fistula and plastic operations, in the execution of which he acquired a surprising dexterity.

The year 1870 increased his activity still more; because in that year, after the discontinuance of the *Monatsschrift für Geburtskunde*, he founded, in conjunction with Credé, the *Archiv für Gynäkologie*—a journal to which he devoted his best efforts, and which will proclaim his fame for all time to come. Nearly every one of its volumes contained contributions

by him, which in most instances are of uncommon importance: suffice it to point to his essays on the value of artificial abortion, on eclampsia, on the complication of the puerperium with chronic heart disease. In the year 1870, he was called to the battle-field, thus for a time interrupting his activity as a writer and instructor. He superintended a hospital at Forbach, and was decorated with the Order of the Iron Cross in recognition of his merits. When, a few years later, the antiseptic treatment of wounds made a veritable triumphal march through Germany, Spiegelberg was one of the first to employ this method, and to endeavor to make it also applicable to obstetrics. The results of his school, in the latter years, owing to the precision of antiseptic precautions, could bear comparison with the best of their kind. But his text-book of obstetrics, which appeared in 1878, must be considered as the most brilliant result of his activity and the crown of his industry. There he deposited his ripest knowledge, the experience of twenty years; there facts are presented with the greatest objectivity in clear and concise language, although independent subjective views everywhere appear; there the reader is given, not only a schematic representation of the phenomena, but a description of facts corresponding to the reality, based on the purest knowledge, as taken from life. Only a man of his enormous practical experience and his uncommon historical knowledge could write such a text-book. The same criticism and acumen of judgment which characterize his book he also showed in his lectures. Opposed to all bootless speculations and flights of fancy, as well as to every dogmatic stolidity and prejudice, he endeavored to trace all phenomena back to the simplest fundamental cause. He continually admonished his hearers never to leave the basis of reality, and always cautioned them against attempts to explain by vague suppositions phenomena which are not clear to our perceptive faculties. A particular advantage of his school should be mentioned—he always insisted on the great importance of a thorough theoretical preliminary training, and more especially on the necessity to the practising physician of pathological anatomy. Aside from a most lively manner of delivery, the intellectual wit peculiar to him kept his auditors in rapt attention—in short, he was one of the best and most attractive instructors. He declined a call to the University of Strassburg which he received in 1878, and, grateful for his

decision to remain in Breslau, the University appointed him *Rector magnificus* (President) for the year 1879, and as a particular distinction for his merits, the title of Privy Medical Councillor (*Geheimer Medicinal-Rath*) was conferred upon him.

Besides his eminent literary and professorial activity, he also practised largely as a physician and consultant. The confidence with which he approached the sick-bed had a soothing effect upon the patient and the attendants, and instructed his consultants while it dispelled their doubts. Such incessant activity, however, did not prevent him from devoting the greatest care to the welfare of his family, and, aided by his wife (*née* De Bary, from Frankfort-on-the-Main), to give his children an exemplary education. The latter sustain in his early death a heavy and irreparable loss. But science, likewise, has lost him much too soon. While engaged in the revision of the second edition of his text-book, he was called away. His greatest complaint was, that his severe suffering prevented him from finishing the cherished work. For the same reason he was unable to execute his favorite desire, to write a text-book of gynecology. Formerly in rugged health, this otherwise hale and hearty man began to complain last spring of increasing illness. When the examination of his urine showed the presence of albumen and casts, his friends no longer doubted that he was in great danger. It was hoped that a residence at the Riviera, in Italy, would strengthen him; only apparently improved he returned, and during the summer resumed his professorial duties. His physicians succeeded in dissuading him from the unpleasant belief that he was suffering from contracted kidney, and in keeping him in doubt as to his real condition. The fear of his friends, however, that his days were numbered, was unfortunately too soon verified: having returned in a worse condition from a sojourn in the country, he succumbed, after a severe death struggle, to his painful affection, at the age of fifty-one. The autopsy showed contracted kidney and hypertrophy of the heart.

What was mortal of Spiegelberg has passed away; but his memory will never fade, for his works secure him immortality.

DR. M. WIENER.

UNIVERSITY OF Breslau, October, 1881.

DEPARTMENT OF DISEASES OF CHILDREN.

EDITED BY . . . GEORGE B. FOWLER, M.D.

ORIGINAL COMMUNICATIONS.

FARINACEOUS INFANT FOODS.

BY

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New York.

WE are frequently forced to employ other food than mother's milk for young children, and, in determining what shall be the substitute, we are well-nigh appalled by the tremendous array of articles, simple and complex, proprietary and domestic, which confront us; and each separate one of which is enthusiastically represented as possessing qualities utterly impossible in any other preparation.

Of course, the universal attempt in these days of popular science is to offer "a perfect substitute for mother's milk;" a preparation which will be as like it as possible in chemical composition and nutritive value.

On account of the importance of the subject, the frequency with which we are compelled to resort to these "foods," and the conflicting experiences common to the profession in respect to their utility, I thought it worth while to attempt an examination of a few of the prominent commercial preparations.

At the outset, we are struck with the fact that we are to deal almost exclusively with farinaceous substances, and this being the case, the microscope will constitute our chief, *though by no means only method of analysis.*

In order, then, that we shall be able to determine whether the results of investigation bear out the claims of the "accom-

panying circular," it is necessary to familiarize ourselves with the chemical composition, the structure, and physical properties of the cereal grains and their pulverized products, and to thoroughly understand their dietetic value.

The principal edible grains are wheat, barley, rye, oats, Indian corn, and rice. They each contain nitrogenous matter, starch, dextrin, fat, and mineral salts. The relative proportions and peculiar nature of some of these ingredients, it is important to note, however, vary somewhat in the different grains, and in the same species of different localities. According to Payen,¹ the following is the respective composition of the common grains.

	NITROGEN- OUS MATTER.	STARCH.	DEXTRIN, ETC.	FAT.	SALTS.	CELLULOSE.
Wheat	18.00	66.80	7.50	2.10	2.50	3.10
Oats	14.39	60.59	9.25	5.50	3.25	7.06
Barley	12.96	66.43	10.00	2.76	3.10	4.75
Rye	12.50	64.65	14.90	2.25	2.60	3.10
Indian corn.	12.50	67.55	4.00	8.80	1.25	5.90
Rice	7.55	88.65	1.00	0.80	0.90	1.10

Of course, no two samples of different specimens of any one of these grains will give the same result, and, therefore, these figures are only approximative. As illustrative of this, I give the results obtained by Poggiale, Polson, Mayer, Fehling, and Maist, who analyzed many specimens of the various cereals, and found the extremes, per cent, of nitrogenous constituents to be as follows:²

Wheat ³	7. - 14.4
Oats	10.69 - 15.59
Barley ³	7.8 - 17.46
Rye	8.8 - 15.83
Maize	8.7 - 9.9
Rice	7.2 - 7.8

They all contain potassium, sodium, lime, magnesium, ferric oxide (Fe_2O_3), silica, carbonic anhydride (CO_2), sulphuric anhydride (SO_3), and phosphoric anhydride (P_2O_5). Of this last, rice contains least, and maize next. The ash of barley and oats contains more silica than that of other cereals. In other respects, the difference is not marked, as regards mineral constituents.

¹ Substances Alimentaires. Paris, 1865.

² Watt's Dictionary of Chemistry, vol. i., p. 829.

³ These estimates for wheat are lower and those for barley higher than I have been able to find elsewhere.

Proceeding now to study the nutritive value of these grains, the most prominent fact which arrests attention is, that they each contain representatives of all the essential "proximate principles," but in varying proportions. That is to say, wheat contains the most albuminous matter, rice the least; rice the most starch, oats the least; Indian corn the most fat, rice the least, etc.

Now, it is an important physiological fact that, to properly subserve the purposes of a healthy organism, food must contain these various substances: albuminoids, hydrocarbons, and mineral matter in proper proportion; and it has been equally well demonstrated by the "Gelatine Commission" and by numerous other independent observers that animals fed upon a single proximate principle, or upon a single class of these substances, very soon manifest disgust, ill-health, and finally die of starvation.

These facts are so forcible, so universally accepted and elementary, that it is rather startling to find it stated, in a recent paper bearing upon this subject, by Dr. Ephraim Cutter,¹ with a view to show that pure nitrogenous matter will support life, that, according to "Magendie, the immortal French physiologist, gluten by itself secures complete and prolonged nutrition." It is true that the Commission, through Magendie, did report in this wise, but the fact was so surprising and unexpected that they were forced to explain it by admitting that the gluten employed was not pure, but, on the contrary, must have contained some starch, fat, and mineral matter.²

Indeed, we now know that crude gluten is not a simple, pure, nitrogenized substance, but is a complex body, composed of vegetable fibrin, vegetable casein, and albumen, and gliadin (this last is the isolated adhesive substance), and, unless great pains are taken in its preparation, will persistently retain a certain amount of starch and fat.

The next question which it will be interesting to determine is, is any one of these seeds or any combination of them, taken alone, water only being allowed in addition, capable of sustaining nutrition? This we can ascertain by resorting to what is known respecting the *daily requisite amount of food*.

According to Dalton, Moleschott, Payen, and Playfair, the average daily quantity of albuminous and non-nitrogenous matter in the food of a healthy, active man is about as follows:

Albuminous matter.....	130 grammes.
Non-nitrogenous matter (calculated as starch).....	600 "

¹ American Med. Weekly, Jan. 7th, 1882.

² Compt. Rendus, tome 13me, p. 282. Paris, 1841.

It is apparent, then, that, in the daily diet, according to this estimate, the albuminous stands to the non-nitrogenous ingredients as 1 to 4.62.

These relations vary with age, sex, physical and mental activity, etc.

In the natural food of the young, mother's milk, the proportions are: in human milk, 1 to 2.95; in cow's milk, 1 to 3.27. In the food upon which adult cattle feed, grass and hay, the proportion is as 1 to 11.70 and 1 to 9.28 respectively.¹ The marked increased proportion of albuminous constituents in the aliment of the young is necessary in order to meet the demands of growth and development.

Now, turning to our table of the composition of the principal cereals, it is an easy matter to estimate, in each variety, the relation which exists between the two chief ingredients, hydrocarbons and albuminates. But it is necessary to explain that, in this calculation, the fat is estimated as starch, by multiplying it by 2.4. This is because what is called the "respiratory power" of fat is about that amount greater than starch, sugar, and other carbohydrates. That is to say, 100 parts of starch requires 118.58, and 100 parts of fat 287.76 parts of oxygen for complete oxidation (conversion into carbonic acid and water).

Proceeding, then, upon this basis, I find the proportion of nitrogenous to hydrocarbonaceous material in the cereals to be as follows:

RATIO OF ALBUMINOIDS TO HYDROCARBONS.

(Calculated from Payen.)

Wheat.....	as.....	1 to 4.40.
Oats.....	".....	1 to 5.78.
Barley	".....	1 to 6.48.
Rye.....	".....	1 to 6.79.
Maize.....	".....	1 to 7.41.
Rice.....	".....	1 to 12.12.

(Calculated from Letheby.²)

Wheat flour.....	as.....	1 to 7.5.
Oat meal.....	".....	1 to 6 2.
Barley meal.....	".....	1 to 12.8.
Rye meal.....	".....	1 to 9.8.
Indian meal.....	".....	1 to 7.7.
Rice.....	".....	1 to 12.9.

¹ Milne Edwards, quoted by Dalton, loc. cit.

² On Food. New York, 1872, p. 5.

Remembering the estimated proportion of these principles required per day (as 1 to 4.62), it is seen that wheat alone, of all the rest, is capable of supplying the requisite amount. But civilized man does not eat whole unhulled wheat, or grain of any kind; and, if he did, he would be compelled to continually select the very best quality, for some varieties only contain seven per cent of nitrogenous matter. It is the flour which we use, and which is found to contain in a hundred parts—

(COMPOSITION OF WHEAT FLOUR [LETHEBY]).

Nitrogenous matter	10.8.
Starch, etc.....	70 5.
Fat.....	2.0.
Salts.....	1.7.
Water.....	15.0.
	<hr/>
	100.

By this table, then, about eight per cent of albuminous matter has been lost in the bran, and we now have, in the edible product, the relations between the two principles in the ratio of 1 to 7.5—an entirely inadequate proportion for a food used singly.

It is perhaps unnecessary to enter further into the details of this part of our subject, or to speak at length of the mechanical processes by which grains are prepared for culinary purposes and the digestive functions. It seems to me that the tables already given sufficiently demonstrate the fact that no easily digested product, when used alone, and as generally met with, of any of these grains, is to be relied upon for any length of time to support life and maintain health.

It is possible, however, by skilful manipulation in the milling process, to vary the relative proportions of the constituents of a particular brand of grain by adding other grains of either a superior or inferior quality. By this means, it certainly is possible to greatly increase the nutritive value of the product, and, theoretically, even bring it up to the standard of a food sufficient in itself for prolonged nutrition.

We hear a great deal said about the pernicious practice of endeavoring to produce the whitest flour; that thereby we sacrifice the bran, which contains all the nitrogenous matter. This idea is fallacious, for wheat flour of good quality contains sufficient albuminous material, employed as it is. We consume

meat and various other substances rich in nitrogen, thereby amply making up any deficiency in the flour, and what is important, are thus enabled to enjoy a varied diet. If we were forced to live upon vegetables alone, then it would be time to consider the feasibility of saving and devouring the bran. Poggiale, however, has shown that bran, though possessing considerable nutritive value, consists of fifty per cent of indigestible matter, which can be successively passed through the bodies of several animals without suffering any change.

Graham flour is a variety of milled product where some of the outer coats of the grain have been retained; and the repulsive *pumper-nickel* of Westphalia is an example of bread made from the wheat grain ground whole. The whiteness of bread renders it attractive to the eye and stimulating to the appetite, and we shall presently see that it is an error to regard the nitrogenous constituents of grain as existing solely in the coverings of the kernel.

Barley is the only other grain which merits serious consideration in this connection. Barley meal constitutes the principal food of the laboring classes of parts of Great Britain and the continent of Europe. It is cheaper than wheat.

By reference to the table of composition, it will be seen that barley is poorer than wheat in albuminous constituents; the ratio between them and the hydrocarbons being, according to Payen, as 1 to 6.48; according to Letheby, as 1 to 12.8.

Barley contains no gluten; its dough is wholly inelastic, similar in this regard to Indian meal. Its nitrogenous substances are vegetable casein, fibrin, and albumen.

The *structure* of the different cereal seeds is, in the main, quite similar, though there are variations which are well enough marked to enable us to detect, by the microscope, any particular one.

Figure 1 represents a vertical section of a grain of wheat.

The grain consists of integument and parenchyma. There are four well-marked coats. The first, from without, is the epispERM; then come, in regular order, the middle, inner, and gluten coats. The first three are made up of elongated, flattened cells, composed of hard silicious material, the cells of the two most external layers being arranged longitudinally; with respect to the shape of the grain; while the cells of the third or inner coat are at right angles to these. The gluten coat is dis-

tinguished by its large ovoid cells, which are seen to contain dark granular matter (gluten, vegetable albumen, fibrin, fat, etc.). Then comes the great cavity of the grain, filled with starch-granules packed closely together, and contained in delicate cells formed by the branching and inosculating cellulose.

The starch-granules and cellulose cavities are largest at the circumference, and grow gradually smaller towards the centre of the seed.

Gluten, although present in the gluten coat in considerable amount, is not confined to that region. It is now known that this substance exists in granular form throughout the parenchyma of the grain, packed in with the starch. Indeed, it is here that we find it in greatest proportion.¹ Fat, albumen, etc., also are intermingled here. It is absolutely impossible, there-



FIG. 1.—Section of Wheat Grain (Hassall.)

fore, to get rid of *all* the gluten, as the popular cry is, by sifting out the bran. And there is another structural reason why this cannot be accomplished by physical processes. The grain of wheat has a longitudinal furrow, which dips down more than half way through. This furrow is formed simply by the grain being folded upon itself, and the gluten coat, with the other external coverings, is continuous, not only around the entire seed, but throughout the furrow. It is practically impossible in milling to isolate the integuments of this depression.

About one-half the mineral constituents are contained in the coatings. In the epiderm, or outer coat, is a peculiar nitrogenous substance, called *cerealine* by its discoverer, Mège-Mouries, and which has a diastatic property, in that it converts starch into sugar, dextrin, and lactic acid.

¹ Pavy: *Food and Dietetics*. Phila., 1874, p. 227.

Starch from the various vegetables can generally be very easily distinguished by the microscopic characters of the granules. Wheat starch from common raw flour consists of round or ovoid flattened bodies, varying in size from 2.5 micromillimetres ($\frac{1}{10000}$ inch) to 40 μ m. ($\frac{1}{600}$ inch). The majority are about 25 μ m. ($\frac{1}{1000}$ inch). In flour thus examined, most of the corpuscles are isolated, but there are many bundles of them

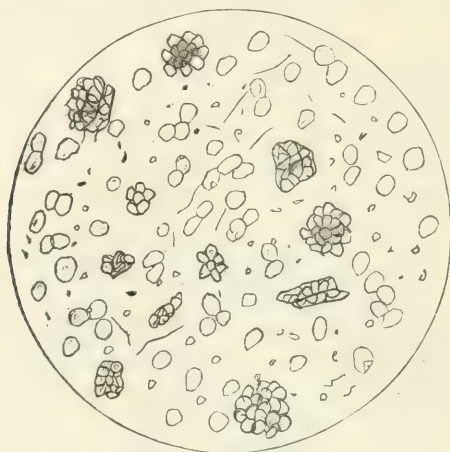


FIG. 2.—Ordinary Domestic Wheat Flour. 120 Diameters.

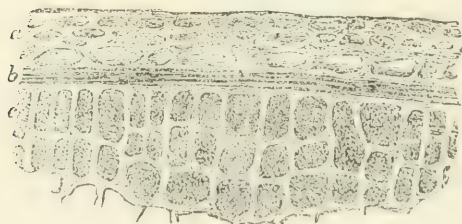


FIG. 3.—Section of Barley Grain (Hassall.)

still inclosed within the cellulose cavities (Fig. 2). The larger granules sometimes present concentric markings, and occasionally a hilum is seen near the centre.

The structure of barley grain is shown in Fig. 3. The chief distinction is its several rows of granular cells occupying the situation of the gluten cells in wheat. They contain a very insignificant amount of gluten, however, but other vegetable albuminoids before mentioned. It will be observed, by way of

identification, also, that these cells are smaller than the corresponding ones of wheat, and the outlines of the cells of the external coats are wavy instead of beaded, as are those of wheat (not shown in the cut). The starch bodies of barley are with difficulty distinguished from those of wheat. As a rule, they are somewhat smaller. There appear to be more of the very smallest size than in wheat.

Barley flour is not as nutritious as wheat flour, its starch granules are less soluble, and its husk is acrid.¹ Indian corn

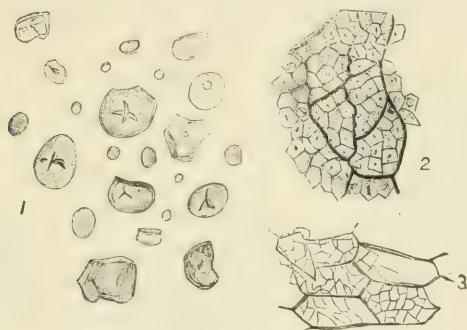


FIG. 4.—1. Starch Grains of Indian Corn. 450 Diameters.
2. Cellular Arrangement of the Granules. 120 Diameters.
3. Empty Cellular Tissue. 120 Diameters.

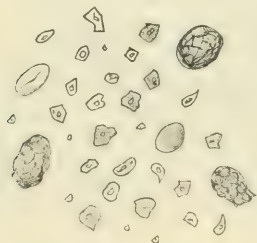


FIG. 5.—Starch Granules of Oats. 420 Diameters.

starch granules present appearances which are illustrated in Fig. 4, and which are very distinct and characteristic. They are irregular and angular, show a fracture-like hilum, and are about the size of wheat-starch granules.

The starch from oats (Fig. 5) is also easily recognized. The bodies are all quite small, mostly flat, and irregular in shape. Many bundles of them are seen, as in wheat.

¹ Hassall, 'Food; its Adulterations, etc.,' London, 1876, p. 293.

These illustrations and brief descriptions will suffice to enable us to intelligently examine the farinaceous foods supplied to us by enterprising manufacturers.

The preparations which I shall describe in the present paper are a few only of the many in the market. They are those, however, best known, being HORLICK'S FOOD, IMPERIAL GRANUM, "A B C" CEREAL CREAM, "A B C" CEREAL MILK, RIDGE'S FOOD, ROBINSON'S PATENT BARLEY, FARWELL & RHINES' GLUTEN FLOUR, SAVORY & MOORE'S BEST FOOD FOR INFANTS, NESTLE'S MILK FOOD, GERBER'S MILK FOOD, ANGLO-SWISS MILK FOOD.



FIG. 6.—Horlick's Food. 450 Diameters.

1. Seed Coverings of Wheat.
2. A Flake Showing Vertical Section of Wheat.
3. Cellulose with Starch Granules.
4. Bundles of Starch Granules Changed to Dextrin and Glucose.
5. A Few Free Changed Starch Granules.

HORLICK'S FOOD FOR INFANTS AND INVALIDS.—This is a dry, brown granular material, and quite sweet to the taste. Under the microscope, it presents the appearances represented in Fig. 6, and is evidently a wheat meal, every portion of the grain being represented. It is almost impossible to draw the

varied forms which appear, consisting of fragments broken in all directions, starch granules, free and still in the meshes of the cellulose, beards of the grain, etc. The large, dark, irregular masses largely preponderate (4), being clumps of starch partially converted into glucose. On the addition of a drop of a solution of iodine, these masses turn a reddish-brown (dextrin), while a general blue scum pervades the whole specimen (soluble unconverted starch).

A watery solution of Horlick's food in a test-tube reacts strongly to Trommer's test for glucose, and gives strong blue color with iodine, masking the red reaction of dextrin with the same agent. We have in this article, then, a very commendable attempt to utilize the entire wheat grain, and to aid its assimilation by anticipating the diastatic action of the digestive

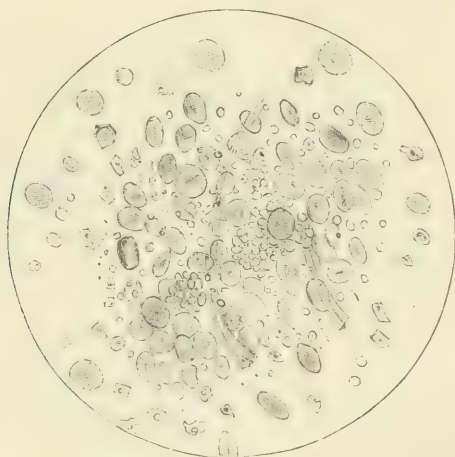


FIG. 7.—Imperial Granum. 300 Diameters.

juices. But the conversion is only partial. Whether, however, a complete transformation into glucose is desirable is a question, and one to be determined by practical tests. The irritating effects and indigestible character of the bran in this food is an objection.

IMPERIAL GRANUM.—“In composition principally the gluten derived by chemical process from very superior growths of wheat—a solid extract.”

If the material from which this preparation is derived contains any gluten at all, the “chemical process” resorted to in

order to extract it has at the same time either destroyed it, or so altered its characters as to render it no longer recognizable by the usual tests.

It has every characteristic of being simply coarse barley flour: the odor—which, by the way, is a good test for barley, a peculiar fatty-acid smell—the microscopic appearance (Fig. 7), and its inability to form an adhesive dough. The question of “solid gluten extract” is easily settled by making a little dough of it, and comparing its elastic qualities with wheat flour similarly treated. Then note the marked difference in the odor of the wet dough of the two. Endeavor to isolate the gluten from the dough by washing on a sieve, and the entire mass will dissolve. Try the experiment with ordinary wheat flour, and note the contrast in behavior. Barley flour can be purchased cheaper than imperial granum.

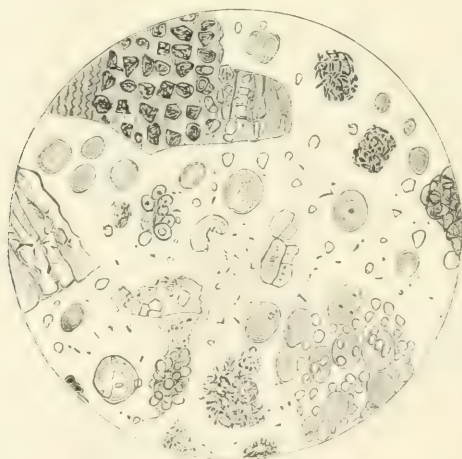


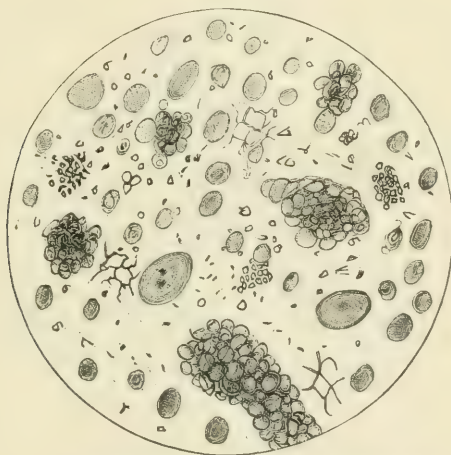
FIG. 8.—Cereal Cream. 450 Diameters.

“A B C” CEREAL CREAM.—“Prepared from the most nutritious and digestible parts of the choicest wheat and barley. All impurities removed. For dyspeptics, invalids, nursing mothers.” This is just what it purports to be—a coarse meal of barley and wheat. Examination shows all the constituent parts of the two grains. Fig. 8.

“A B C” CEREAL MILK.—For infants and children. “From the choicest white wheat, a large proportion of the starch and all impurities being first removed, steam cooked, and desiccated

with proper quantity of barley and sugar. . . ." A very finely pulverized flour, composed, as is claimed, of wheat and barley. Sweetened with cane sugar. Barley seems to preponderate, judging from the odor and brittleness of the dough. The claim that a large proportion of the starch has been removed is unnecessary, as it is untrue. It possesses the nutritive qualities of a mixture of barley and wheat. The addition of the former should only serve to bring down the price.

RIDGE'S FOOD.—Is apparently barley flour finely ground. The odor, dough, and microscopic appearances indicate no other ingredients. It contains no glucose, and is not sweet to the taste.



G. 9.—Robinson's Patent Barley. 450 Diameters.

ROBINSON'S PATENT BARLEY (Fig. 9).—Patent barley, technically, is ground pearl barley. Yet this preparation, while possessing most of the characters of what it purports to be, is somewhat unlike pure barley flour. Its dough is more adhesive, and the white color, together with the mild barley odor, suggest the admixture of wheat flour. No gluten cells are seen, but there are numerous granules unaffected by iodine, and turned red by carmine solution (albuminous matter). The figure shows starch granules free and in bundles, held together by the cellulose. The larger corpuscles are probably those of wheat.

FARWELL AND RHINES' GLUTEN FLOUR.—"A gluten flour substantially free from starch. For dyspeptics, diabetics, and

invalids." This flour has evidently been prepared with great care, and the result is a product containing about twenty-five per cent of gluten and other nitrogenous elements. It is not "substantially free from starch;" on the contrary, contains about seventy-five per cent of this element. The high nitrogenous grade has, no doubt, been attained by grinding the entire grain coarsely, and subsequently blowing and sifting out most of the light sealy bran, together with the isolated starch corpuscles. I arrive at this conclusion because microscopically all the particles are about the same size, consisting of uncrushed bundles of starch and flakes of gluten cells (Fig. 10). The scarcity of free granules

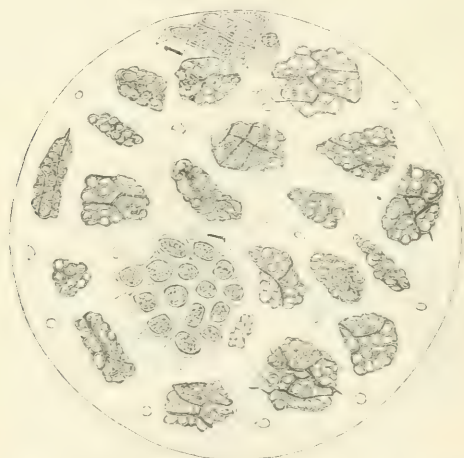


FIG. 10.—Farwell & Rhines' Gluten Flour. 120 Diameters.

is striking. The flour is dark-colored on this account, very dry, and feels like fine sand. The dough is unusually glutinous. There is an unmistakable odor of barley, and the uppermost figure in the cut is a collection of the so-called gluten cells from barley. The middle figure, marked 1, shows the analogous cells from wheat. It seems to me that this flour should answer the purposes for which it is intended, though I fail to understand the dietetic advantage of the addition of barley.

SAVORY AND MOORE'S BEST FOOD FOR INFANTS.—"The only food especially prepared for infants. The highest amount of nourishment in the most digestible and convenient form. The infant prince thrives upon it."

Dough slightly glutinous. Barley odor. Under microscope,

Fig. 11, are seen wheat and barley cells, bran, and clusters of gluten cells from both wheat and barley. In fact, all parts of the grains are represented, intermingled with much granular nitrogenous matter, fibres, beards, etc. It is a rich meal.

GERBER'S MILK FOOD FOR INFANTS, CHILDREN, AND INVALIDS.—This is a fine brown powder, with an attractive odor, resembling that of fresh cake, and decidedly sweet taste. A solution of it in a test-tube reacts strongly to Trommer's test, and is turned blue by iodine.

The microscope reveals masses of baked starch corpuscles, milk globules, and granular matter. On the addition of a drop of iodine solution, most of the starch bodies instantly turn blue, some red (dextrin), while the granular matter remains unaffected. This latter, however, is stained red by carmine, prov-



FIG. 11.—Savory & Moore's Best Food for Infants. 450 Diameters.

ing it to be albuminous. Consisting, then, of wheat flour, which has been subjected to dry heat to the extent to partially convert it into dextrin, of glucose, and dried milk, this preparation certainly possesses a high degree of nutritive value, and is an ingenious and elegant article.

NESTLE'S MILK FOOD is, in appearance, taste, odor, reactions to iodine, and the tests for glucose, practically identical with Gerber's food. The conversion into dextrin is, I think, somewhat more complete, and the starch granules are scarcely recognizable as such, having been destroyed by heat. The slightly

darker color of this food, as compared to Gerber's, at once suggests a greater degree to torrefaction, and more dextrin.

ANGLO-SWISS MILK FOOD.—This is similar to the two preceding in general appearance and composition. It, however, has not the pleasant odor of either of these, the smell of lactic acid being very pronounced. In fact, the food is sour; it promptly turns moistened blue litmus paper red.

Though these analyses and general remarks are far from exhaustive, I trust they are sufficient to remind us of the proper scientific foundation upon which infant food should be based. I have endeavored to show also, *that simple microscopic inspection, unaided by chemical means and physical processes, is wholly unreliable and inadequate in determining the composition and nutritive worth of these farinaceous substances.* The presence or absence of gluten cells certainly does not decide the question. These cells are as large as most of the cavities of the cellulose which contain the bundles of starch corpuscles, and, therefore, in flour ground fine enough to break up these bundles and set the corpuscles free, the gluten cells will also have been broken up, and their granular contents liberated. And, as already mentioned, gluten is in excess throughout the body of the grain, and there primarily exists in granular form.

I am prompted to thus repeat and insist upon these points, because I see that so reliable an authority as Dr. Jacobi has accepted and enthusiastically indorsed the conclusions arrived at by Dr. Ephraim Cutter, in the article already quoted, who relies altogether upon the absence or presence of gluten cells in estimating the nutritive value of farinaceous preparations. I must, with all respect, protest against Dr. Cutter's method,¹ his conclusions and physiological arguments, as well as the remarks of his editor, Dr. Gaillard.

The elastic adhesive properties of the dough, a simple test though it be, and the proportion of crude gluten which remains after prolonged washings through a cloth or sieve, determines, with sufficient accuracy for ordinary purposes, the quality of the product, with respect to nitrogenous ingredients, notwithstanding a portion of some of the soluble forms are washed away. For, although this crude material is made up of several albuminous substances—vegetable fibrin, casein, albumen, etc.—and contains some starch and fat, it is the pure gluten or *gliadin*

¹ Infant Feeding and Infant Foods, Medical News, Feb'y 18th, 1882.

which imparts the adhesiveness and entangless all the rest. Gliadin is absent from the so-called gluten of barley, rye, and Indian corn (Ritthausen').

In order to comply with the nutritive standard, insure a uniform proportion and avoid variations in fresh milk, a few manufacturers have ingeniously added dried milk and grape sugar, the results being very popular preparations.

It is not my present object to enter into the details of infant digestion. Whether any of these patent foods are adapted to the uses for which they are intended, will be and is being determined by practical trials based on analyses similar to these which I have endeavored to make. That they are a desideratum, when properly made, and are daily serving a useful purpose, is beyond question.

OPHTHALMIA NEONATORUM.

BY

LYMAN WARE, M.D.,

Chicago, Ill.

I PROPOSE particularly to call attention to a disease which, although the most tractable, is the cause of more unfavorable results than all other eye diseases of childhood combined. Why is it so? Sometimes I think it is more from carelessness than ignorance. Certainly when so much is at stake, for without treatment the disease is very apt to result in total blindness, you would think there was no excuse for carelessness and neglect; yet it is astonishing how much indifference there is among mothers, nurses, and even doctors respecting this affection. The disease of which I speak is *ophthalmia neonatorum*.

It is of the greatest importance in this disease to make a correct and early diagnosis. In some diseases it signifies little whether you diagnosticate definitely to-day or to-morrow, but here you cannot afford to lose a single hour. In many cases too much valuable time has already been lost, and the destructive

¹ Die Eiweisskörper der Getreidearten, Hülsenfrüchte und Oelsamen. Bonn, 1872.

tendency is so great that irretrievable damage may have been done. Mothers and nurses will invariably tell you, when you ask them why they have so neglected the case, that they did not consider it worth while to call the doctor's attention to it. They thought a little breast-milk or some favorite eye-salve would do as well or even better, and so not only hours, but days may have been lost.

When seen in its earlier stages, there should be no doubt regarding a most favorable prognosis.

There are two causes of this disease, and, I believe, but two. A leucorrheal or gonorrheal discharge in the mother, the former oftener than the latter, as it is by far the more frequent disease. I do not believe that cold, dazzling light, jaundice, a plethoric condition, soap and water, whiskey and water, or whatever else may have been used upon the infant, ever caused ophthalmia neonatorum; although any one of them might be the cause of other conjunctival inflammations.

Byford thinks that eighty per cent of women who are confined have a leucorrheal discharge, and that probably five per cent of the children are inoculated.

The leucorrheal discharge may be more virulent in some cases than in other. Yet, this alone will not account for so small a percentage; for women with gonorrhea, which is the most virulent of poisons, sometimes give birth to children who escape unharmed. The most probable explanation is that the instinct of the infant is superior to the knowledge of the mother, and curls its eyelids inwards and thus avoids the poison.

The disease makes its appearance during the first week. Of fifty cases, of which I have record, it varied in its appearance from two to six days after birth. Very seldom does it occur upon the first day, and when after the seventh, the probability is that inoculation has taken place in some manner after confinement. The greatest number of cases occurred upon the fourth day.

The *symptoms* are unmistakable. First from one eye, then the other, a thick, creamy pus oozes and dries, agglutinating the ciliae as perfectly as though mucilage had been used.

Care must be exercised in separating the lashes, particularly if they have been long glued together, as the quantity of pus confined beneath the lids is sometimes so great as to spurt out with a violence sufficient to be dangerous to the operator.

Later, as the disease advances, the swelling increases, particularly in the upper lid which becomes so much distended as to overlap the lower.

The tissues within also become turgid with blood. The conjunctiva, both ocular and palpebral, becomes greatly reddened and thickened. Often the chemosis is so great that it is almost impossible to obtain a good view of the corneæ, and complete eversion of one or both upper lids is not infrequent.

The quantity of creamy pus secreted at this stage of the disease is exceedingly profuse, yet seldom does it interfere with the nutrition of the infant which nurses, sleeps, and grows fat, happily unconscious that it may also become blind.

It is at this time that irreparable damage may be done. The entire cornea may at first present a general hazy or milky appearance which soon becomes yellowish, and finally ends in complete suppuration. In other cases, where the inflammatory action is not so great, or the condition of the infant more favorable, or seen at an earlier stage, the ulceration may be more circumscribed, and, although the eye may escape complete disorganization, there will probably be prolapse of the iris and subsequent staphyloma, and opacities of cornea with strabismus and more or less amblyopia.

Prophylaxis.—In this disease, as in all others resulting from a known cause or special poison, prevention is much easier than cure.

In all cases of expected confinement, when there is a vaginal discharge of whatever nature, the most scrupulous attention should be given to its correction. Immediately before confinement, or even during its progress, the vagina should be most thoroughly cleansed with an abundance of warm water, or still better, disinfected by means of a four-per-cent solution of boracic acid. The moment the child is born, even before the cord is severed, the obstetrician, not the nurse, should, with a soft rag or absorbent cotton, most carefully wash the lids and surroundings with a weak one-per-cent solution of boracic acid. The ciliae should be particularly examined, and all secretion perfectly removed.

The child should be seen occasionally for at least a week after confinement, and if the disease be anticipated, it ought to be visited daily. It is by no means safe to take the statements of others, because so few realize the great importance of early symptoms and treatment.

When the disease is once diagnosticated, be resolute in treatment. Many an eye has been sacrificed through hesitation and vacillation. Give strict and definite orders, and see personally that they are observed. One is often astonished and discouraged at the wilful neglect and carelessness with which directions are sometimes followed. In this disease, if your orders are not faithfully observed, the best treatment in the world may not be able to bring about favorable results. For instance, I have known a nurse to use the same small tea-cup of solution for an entire day. Thus, what was intended as a disinfectant, became highly infectant. If you do not see the case from the beginning, be sure and ascertain exactly how much damage has already been done; otherwise you may receive more credit than you deserve. By having the infant's head placed upon your knees, and with this small elevator, which will not be apt to



Actual Size.

frighten the most timid of mothers, you will, in most cases, have little trouble in obtaining a good view of the cornea. Great gentleness must of course be exercised, for should an ulcer already exist injury might be done.

The most scrupulous cleanliness must be insisted upon. Until this last year or two we have depended altogether upon an abundance of clear water for this purpose. I do not think we have been disappointed in its effect; yet solutions of boracic acid are used so freely in other branches of surgery, and spoken of so highly for their antiseptic and disinfectant properties, that we now make use of weak solutions—one to two per cent—of this substance for all cleansing purposes. Vaseline ought to be applied to the ciliae to prevent any adhesion and consequent retention of pus. There is no objection to using soft sponges about the eye, *provided* they are from time to time thoroughly disinfected. What, however, is far better is absorbent cotton, which can be immediately thrown away. Whatever is used

care must be taken not to over-saturate them, so as to soil or chill the infant.

In this manner the eyes must be faithfully cleansed as often as occasion demands. You will be asked, how often? Say, every five minutes, day and night, if necessary. The care for a few days must be incessant. By no means resort to any kind of syringe for the purpose of cleanliness. Much harm may be done both to the infant and the nurse, as the chances of inoculation are very much increased, and even at best the object can be but poorly accomplished. Do not intrust the medical applications to the nurse until all danger is over. The remedy of all remedies in this disease I believe to be nitrate of silver. Yet it is as a two-edged sword, and for that reason many teachers, notwithstanding they acknowledge it a most excellent and almost indispensable medicine in ocular therapeutics, hesitate to recommend it, fearing some may do more harm with it than good. I much prefer a solution, the strength of which varies according to the condition of the infant and the stage of the disease.

When the discharge is profuse and creamy, and seen for the first time, I do not hesitate to apply so strong a solution as 3 to 32 (45 grs. to $\frac{5}{8}$ i.).

Placing the infant's head in the same position as when we made the examination, evert the lids and remove perfectly all secretion by means of the absorbent cotton. We apply the solution with a camel's-hair pencil. Care must be taken that there be not enough of the solution on the pencil to run over the eye.

The epithelial layer of the cornea must be preserved. The tendency of the disease alone is to destroy it, and should the strong solution come in contact with it, bad will simply be made worse; we will but aid, instead of checking the disease. The lids, which are still everted, are to be lightly touched with the pencil, and after a few seconds, any superabundance of the solution is to be carefully removed with water, to which a small quantity of chloride of sodium has been added. The application causes little or no pain, and for several subsequent hours the amount of discharge is notably diminished.

Of course, the general condition of the infant must receive attention. For some inexplicable reason, mothers and nurses insist on keeping the infant in the smallest, darkest, and closest

room in the house. When it is taken out of doors, it is muffled like a mummy, so that it becomes almost asphyxiated by its own breath. By no means resort to local or general depletion, however much such a course of treatment may seem to be indicated by the great amount of local inflammatory disturbance, as the infant will need all possible strength to resist the disease.

As the discharge becomes less profuse and creamy, gradually diminish the strength of the solution, or substitute a weak solution of sulphate of zinc or alum. I repeat, however inconvenient as it may be, the case must be seen every day, and applications made. Sundays or holidays should afford no excuse to neglect these little patients. The omission of treatment for a single day when the disease is at its crisis may be sufficient to turn the scale unfavorably, or at best, greatly prolong it.

A METHOD OF APPLYING CONSTANT SPRING-PRESSURE FOR THE TREATMENT OF BOW LEGS.

BY

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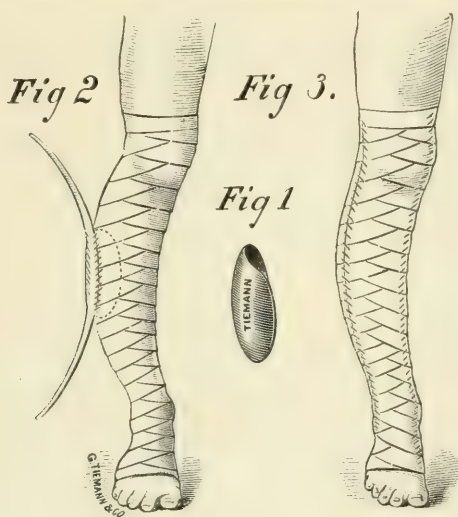
CASES of congenital bow-legs, unaccompanied by disease, or distortion of the knee or ankle-joints, are probably met with, at some time, by almost every medical practitioner. The resulting deformity and awkwardness of carriage are certainly very disagreeable, and prompt me to describe a method which proved most satisfactory in treating the first and only case to which I have as yet applied it.

On February 10th, 1881, I attended the wife a clergyman in her second accouchement. The child born was well formed excepting the legs, which were sharply bowed. The parents immediately consulted me regarding the possibility of curing the deformity, but temporary absence of the family from town removed the child from my notice until May 2d; it was therefore about three months old when I began the treatment, as follows:

Ten or twelve rectangular pieces of muslin—size, two and one-half by three inches—were loaded with fresh plaster of Paris, wet,

and applied one over another to the outer convex portion of the leg. Having quickly, but gently, moulded them to the limb, a retaining bandage was wound over them, and left on until the plaster had hardened.

Upon removal, the corners of the cast were rounded, the edges pared and smooth, and a coating of glue applied both inside and out (see Fig. 1). When the glue had dried, the inner side of the cast was lined, and its deepest concavity slightly lessened, with



cotton-wool. The cast was then re-applied to the leg, and secured by adhesive plaster and a roller bandage.

A sharply-bowed steel spring, covered with thin muslin, and long enough, when straightened, to reach from the knee to the external malleolus, was applied to the outer curve of the leg, as shown in Fig. 2; the muslin covering of the spring being sewed to the bandage at a point over the cast. A bandage was then applied to the foot, ankle, leg, and knee, with sufficient tension to bring the spring in near relation to the limb throughout, after which the bandage was securely stitched to the covered spring, as shown in Fig. 3.

The other leg was then dressed in the same manner.

It will readily be seen that the plaster cast, upon which the middle convex portion of the spring rested, served as a point for counter-pressure.

When the ends of the spring were approximated to the knee and ankle respectively, the force exerted at the centre was distributed over a considerable area by the cast, thus causing the tension to be borne without injury to the parts beneath.

The dressings were examined on the day following that of their application, and, as all looked well, were left undisturbed.

So nicely did the little one bear the restraint, that the dressings remained untouched for seventeen days, or, until May 21st, when the incurvation was found to be much diminished.

The bandages about the ends of the spring had slightly stretched and loosened, thus lessening, in a degree, the action of the spring. Without removing any portion of the dressing from either leg, a light bandage was adjusted over all, with sufficient force to again bring the spring in close relation to the limb above and below the cast.

Nothing more was done for twenty-three days: on June 13th, the dressings were removed, and both legs found straight. At this time, February, 1882, the legs retain their normal position.

The success and safety of this method depend upon the careful use of the forces applied. The cast, upon which the spring rests, should be unyielding. Its longitudinal concavity should be gradually obliterated by filling it with some soft material as the leg straightens. This I failed to do in the experimental case herewith reported.

I experienced no little difficulty in finding just how much spring pressure the legs would tolerate. This point was only decided after springs of different forms and varying resisting power or tension had been made; one or two of which were experimentally applied for a few hours, and removed when found too stiff to be borne by the patient. With the view of determining the length and strength of springs for older children, I made some experiments, and have communicated the results obtained to Geo. Tiemann & Co., instrument makers. I trust the information furnished will assist others in applying the principle.

The anatomist and physiologist may instruct us regarding the age or stage of development at which the application of constant spring pressure may be deemed practically useless. No one will doubt, however, that day and night pressure will overcome the deformity in children very much older than the little one to which I applied the treatment.

SEED IN BRONCHIAL TUBE; PHTHISICAL SYMPTOMS; SPONTANEOUS EXPULSION AFTER TRACHEOTOMY.

REPORTED BY

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THE following case seems to be one of much interest:

June 21st, 1881, I was called to see Master F. N., of Peacham, Vt., two years old the 26th of March previous. The history given me was something as follows:

Feb. 26th, he was in usual health, weighing $33\frac{1}{2}$ lbs. In the afternoon of that day, while playing happily upon the floor, he arose, suddenly threw up both hands, and came near choking to death before the mother could reach him. The usual expedients, such as slapping on the back, blowing in the face, etc., were resorted to, and he soon breathed more easily, although respiration never became normal. The third day after his symptoms were considered pneumonic, and treated as such. With remissions and exacerbations his condition remained about the same until the middle of April, when the expectoration commenced to be more profuse and very offensive.

About the 5th of May, afternoon fever, night-sweats, and other hectic phenomena led the attending physician, Dr. Parker, to consider it a case of phthisis, and render an unfavorable prognosis. Dr. Brooks, of St. Johnsbury, saw the child twice in May, and, thinking it a case of foreign body in the air-passages, recommended an operation.

This and much more was told me at my first visit, when the following was the condition of affairs.

Child anemic and much emaciated; temperature, 104° ; pulse, 140; respiration rapid and difficult. Was lying in his little wagon propped nearly erect, with the head thrown peculiarly backward, giving prominence to the larynx. He had never been able to lie prone since the 26th of February mentioned.

Parents told me that he had raised nothing for several days, and that this condition was always accompanied by high fever, which had each time subsided when expectoration was re-established. Left muriate of ammonia and tr. digitalis to be administered in suitable doses in connection with stimulants. Next morning condition was much improved; temperature, 100°; pulse about 100, and some expectoration.

Taking into consideration the suddenness of the attack, the dyspnœa, the variableness of the symptoms, I diagnosed a foreign body, more or less movable, in larynx or trachea, and earnestly urged tracheotomy.

July 3d, the child was seen by Drs. Wiswell and Warren, of Cabot, who confirmed my diagnosis, and also urged the operation as a last resort.

Wednesday, July 7th, the parents being told the dangers of the procedure and the small chance of recovery, the little fellow was placed under chloroform by Dr. Wiswell. Dr. Warren, assisted by Dr. Blanchard and myself, opened the upper three tracheal rings, and inserted a hard-rubber tube. The external incision being made nearly to the sternal notch and deep, revealed the trachea, which was seized by tenacula. Upon being opened a gush of pus followed, the first thrown off for three days. Owing to extreme weakness respiration failed several times during the operation, and was re-established with some difficulty. The patient, however, finally came out from the anesthesia very well. During the first twenty-four hours the muco-purulent discharge through the tube was very profuse, and was estimated at more than a half pint. After two or three days there was progressive diminution of the discharge, with improvement in all symptoms; increase of appetite, etc.

July 27th, twenty days after the operation, discharge having nearly ceased and breathing normal, the tube was removed, and closely following came the cause of all the trouble: a "*creeper*" seed. This seed very closely resembles that of the watermelon in size and shape. The plant is here called the wild cucumber, and is a member of the gourd family.¹ It is trained over windows and trellises for its bell-shaped flowers, the seeds being contained in a pod resembling a cucumber, hence its name.

¹ *Echinocystis* (Torrey and Gray). Wild balsam apple.

The Sunday following I had the child weighed—26 lbs.—and, in the next three weeks there was a gain of three and one-half pounds. After operation he took very little medicine; cod-liver oil and muriate ammonia for the first two weeks. During this time a spray of steam was thrown upon the parts by an atomizer. I saw the child Dec. 9th, 1881, and he is now fat and ruddy, weighing thirty-nine pounds, with no evidence of the nearly fatal illness, save a small scar.

SPECIAL REPORT OF THE

DISCUSSION ON THE QUESTION OF NOURISHMENT IN THE
PEDIATRIC SECTION OF THE FIFTY-FOURTH MEETING OF
GERMAN NATURALISTS AND PHYSICIANS,

AT SALZBURG, 1881—(*Jahrbch. f. Kindhukde.*, XVII. B., 1 H.).

At the first session, on September 19th, DR. SOLTSMANN (Breslau), being chosen presiding officer, opened the meeting with an extremely able paper, of which the following are the principal points:—In view of the importance of practical work on the part of the profession, work directed systematically and unitedly, there was, on motion of Prof. Demme, a commission appointed at the fifty-second meeting of the association who should prepare papers and lead in general this present discussion of so important a question. In this commission, or committee, were Biedert, Bohne, Demme, Ehrenhaus, Gerhardt, Henoch, Rauchfuss, Soltmann (the speaker), Steffen, Thomas and Wagner. Soltmann, after some discussion with Demme, concluded to send to each member of the commission a circular directing the discussion to the following two different subjects.

“1. *Substitution of natural unadulterated animal milk for woman's milk*, with all the facts brought into consideration by this, as the production and procuring of pure milk, the race differences in cows in regard to quantity and quality of milk, diseases of cows and their transmission, feeding, stall-hygiene, milk-cure institutions, milk tests, and last the question of cost.

“2. *Substitution of artificial foods, with or without milk, for the natural milk*. Analytical examination of the most important of these with practical experimental experience in regard to their worth as nourishment during the first year in health and in disease (Biedert's cream conserve, condensed milk, preparations from Liebig, Liebe, Nestle, Löfflund, Gerber, Hartenstein's, Ligne, etc.). The question of cost.” Thus all points relating to nurs-

ing are omitted and the discussion limited to artificial means of nourishment in the two forms of, first, animal milk; second, substitutes for animal milk. These circulars were widely distributed and have aroused an interest in the question, not only in Germany, but in all Europe, which has been shown not only in elaborate papers, but also in many experiments, reports of valuable data, etc. Soltmann then thanks all those who have been so earnest in the matter and mentions a few in particular. The articles by Biedert, of which abstracts have been given in this JOURNAL, were especially praised. Kruse and Monkewitz with their varied experiments, Monti on "cream conserve," Kormann, Heubner and Wertheimer, Dornblüth, Cnyrim, Jacobi, Hoppe, and some others—these are names already familiar to the readers of our abstract department.

The key-note to all private and published papers on the subject is that the mother's milk is the only rational food for sucklings, and Soltmann well says that "*all the advances made in physiology in respect to the digestive organs of children only go to prove that the mother's milk is the only true material which is quantitatively and qualitatively suited to the development of the child, which preserves the physiological functions of the organs of digestion, and, under favorable circumstances of growth, unfolds the whole organism in its completeness.*"

The next point on which all are agreed is, that when this fails, *animal milk is the only substitute*. It has taken time to reach this conclusion, because of our lack of knowledge of the digestive organs and of the chemical and physiological differences between animal and vegetable foods, because the worth of the various preparations was falsely estimated, and because of the very poor quality of milk which was used. Thus the country became flooded with preparations which "regarded the child's stomach as simply a chemical retort," and presupposed that if a material contained the same chemical constituents as milk, the whole question of nourishment was settled. This idea reached its bloom in the use of Liebig's soup and Nestle's meal, and it has taken time and earnest work to overthrow it. But it has been done. "Now and evermore it is unanimously agreed that these preparations *can in no way be substituted for mother's milk, and as exclusive food during the first year are to be entirely and completely rejected.*" The speaker includes in this the various condensed milks, quoting Fleischmann's remark that "condensed milk of a certain dilution nourishes but is not well borne, of another dilution is well borne but does not nourish."

Attention was again turned to cow's milk. The sources of evil in its production, transportation, and use were more carefully studied. Milk-cure institutions were started to furnish pure milk for sucklings. We learned that the cause of the relative indigestibility of cow's milk was in the caseine, and attempts were made to remedy this, either by the use of cream-mixtures, by the addition to the milk of substances which should make the caseine

more like that of human milk, and finally by experiments in the choice, care and feeding of cows with the object of making the milk, so far at least as the coagulability of the caseine is concerned, more like human milk. When, in addition to other points, Hofmann convincingly proved that the use of pure cow's milk, even at 50 pf. (20 cents) a liter, is by all means the *cheapest* method of nourishment, all dispute seemed to yield. Therefore we now stand at this point:—cow's milk is the only substitute for mother's milk. Our whole endeavor must be to procure and use this in the best way. "This stand-point is a long step in advance on the broad field of work before us, a field in which doctor, experimental pathologist, physiological chemist and farmer must join hands." Soltmann closed with an earnest appeal for interest in the discussion and the subject, and introduced

DR. ALBRECHT (Neuchatel), who reported

CONCERNING THE SUBSTITUTION OF PURE ANIMAL MILK FOR MOTHER'S MILK.

In speaking of animal milk, cow's milk is generally meant. The only advantage in the use of goat's milk is that the goat is easier to keep and feed, but this is more than outweighed by the fact that the goat can only be milked in the summer time, while in fall it becomes dry. Asses' milk, on the other hand, has some decided advantages in regard to digestive qualities, but since the young ass must drink at the same time, the quantity obtained for use is small (1 to 1½ litre pro die) and the cost high.

In general, therefore, we have to consider cow's milk alone. Analyses of cow's milk show the following variations:

Water.....	between 86.271 and 90.581.
Solid matters.....	“ 9.419 “ 13.729.
of which,	
Caseine and albumen.....	“ 1.680 “ 7.092.
Fat	“ 0.666 “ 5.390.
Milk sugar.....	“ 2.522 “ 6.610.
Salts.....	“ 0.055 “ 0.338.

With such variations, why should we lay so much stress on the *greater amount* of caseine in the cow's milk? It is the quality, not the quantity of the caseine which makes the trouble. This we cannot change, but we can at least attempt to provide a milk containing a *constant* proportion of the several constituents.

This is to be done, first, by milk-cure institutions, and second, by practically directed and controlled dairies.

MILK-CURE INSTITUTIONS:—The first of these was founded by GRUB in Stuttgart and is still in successful operation. Another was opened in Frankfort in 1877 with the following avowed objects:

1. The obtaining of cow's milk in the production and handling of which all demands of hygiene are complied with, and which

therefore is fit to be used for purposes of cure, and especially as a substitute for mother's milk in the nourishment of children.

2. No further project of gain and no alliance with other country business, since the choice of the cows and their feeding is in many ways opposed to such projects.

In Hamburg there are several private milk-stalls or stables, under control of physicians, especially Dr. Hoppe. Throughout Europe, there are already many institutions of all grades between these two.

Upon what depends this production of a good cow's milk? A *good* milk may be obtained in the ordinary dairy-farm methods, but to obtain an *equal, unvarying* milk certain conditions must be fulfilled. They are: the race of the cows, their feeding and care, the condition of the stable, and the handling of the milk from the moment it leaves the udder till it reaches the consumer.

In reply to the insinuation that there is too much of luxury in his ideal stable, he here states that this is not so; that, though the price of the milk is somewhat high, yet many people can perfectly well buy it, and, if by this means the general plane of goodness of milk is raised, the poor will be helped.

First, then, as to the race or breed of cows. This is a very important point. There are (in Germany) two separate breeds: the mountain and the lowland breeds. To the first belong all the species of brown, spotted, mountain, and Swiss cattle, also the Allgäuer, Pinzgäuer, and Märzthaler cows. In the lowland class are the Hollandish, Ostfriesen, Oldenburger, Danziger, Holsteiner, and Angler cows. The short-horned breed is used for crossing. The mountain breeds give less milk, but it is richer. The lowland cows give a large quantity, but it is not so rich. It is said that the lowland cows are more subject to tuberculosis, but Albrecht believes this depends more on the stable, etc., than on the breed. The animals must be carefully selected, examined by veterinary surgeons, subjected to trial in a preparatory or quarantine stall, and must be between three and eight years old. The next question is, how long can they be used? Two systems are in use, that of "milking out," and that of breeding. Under the first, the cow is kept on full diet until the milk falls below a certain quantity (10 litres), and then sold. A cow will last one and a half to two years. Dr. Hoppe (Hamburg) uses them only six to eight months. The disadvantage of this is the frequent changes of cows, and the possibility of introduction of disease. Under the breeding system, the cow is milked until rutting time, then given to a sound steer of the same breed, allowed to stand dry for two months before throwing the calf, and the milk again used only after every trace of colostrum has disappeared. Three or four periods of lactation may thus be used, but not more. This system is in use at Frankfurt. (The best milk-cure station.—J. F.)

Next, *the feeding and care of cows*. In respect to this, the author claims that we must at present rely on the experience of the milk institutions, which is all in favor of dry fodder. There

is no scientific proof that this only is successful, but so far it is the best we have, and the delicate test of thousands of children's stomachs is of great weight, without, or even against the most careful comparative analyses.

The rule at Frankfort is: A regular and similar fodder at all times of year. Green fodder is to be avoided, as also all fermenting materials, bitter extractives, oily matters, especially those obtained from breweries, sugar and oil factories. The proper food is selected dry fodder, meadow hay, after-grass from well manured ground, meal or groats of wheat, barley, or oats.

After several years' experience, the following daily diet for one cow has been agreed on as the best:

5	pounds	wheaten	meal,
5	"	"	bran,
3	"	barley	meal,
10	"	fine-cut	hay

are mixed with enough water to prevent dust.

Twenty pounds of hay or alternate hay and after-grass are given for after-fodder. Between principle and after-fodder, and also after the whole feeding, well water—the only drink.

Six grams of salt is put in each mess.

A cow standing dry receives only hay.

In other places, the diet is in general similar to this, though in some rather more generous.

Dr. Biedert, on the other hand, has advised the combination of green with the dry fodder. Albrecht opposes this, but, not daring to pass over so high an authority without recognition, he proceeds to argue that B.'s only reason is to avoid expense. The point comes up in the discussion which follows. The richer feeding, especially oil-cakes, etc., increases the quantity of the milk. This depends somewhat also on the breed of cow, and the period of lactation. With the same cow and fodder, the daily amount (for the 300 days after calving) during 28 days is 19 litres; during 75 days, 11 to 12 litres; and during 197 days, 4 to 5 litres. The average amount in a year may be stated at from 20 to 26 hecto-litres.

The care of the cows.—The first point is great cleanliness. Not only the stall, but also the cow must be daily cleaned. It is only thus that cows can be left standing a long time in the stable. Next, good ventilation and plenty of air. The speaker here goes into a detailed description of an ideal stable and its care.

There remain to consider the collecting and preserving of the milk, what qualities good milk should possess, and the methods of determining these qualities (milk-control).

These are the rules at Frankfort: The milk is milked into tin pails, then emptied through two filters into a large vessel holding about sixty litres. This, when full, is immediately carried into the drawing-off room, a large, cool, well-ventilated room, with cement floor and walls. Thus a mixture of the milk of

several cows is obtained. *This is the only true way to obtain an equable milk.* In using one cow's milk there are constant variations. In the drawing-off room the milk is rapidly poured into white glass flasks holding one-half, one, and one and one-half litres. These are corked tightly, sealed with etiquettes, and placed in the wagon standing ready, well protected from sun and rain, and well ventilated. The empty bottles are washed in warm solution of soda with brushes, then cleansed with pure water. The corks are boiled in solution of soda, and then washed out. To each consumer is given a printed direction for the care and use of the milk.

When milk reaches the consumers so promptly as this, no further means of preserving it are necessary. Where farther transport is needed, two principal methods of preservation are used: that of *cooling* and that of *heating*.

Dornblüth has described the methods of Schwartz and Meidinger by cooling (abstract of article has appeared). This method uses one kilo ice for one litre milk. Meidinger saves ice by first passing the milk through a tube cooled in spring water. This cooled milk will keep at least three days in the hottest summer. What an advantage this is! Klebs recommends heating instead of cooling the milk. Both processes destroy the ferment. Boiling the milk in the household has the same object. Addition of alkalies, borax, salicylic acid, etc., may delay the souring, but cannot take the place of boiling. Boiling changes the specific gravity, the smell, and the taste of the milk. It is, however, absolutely necessary to destroy whatever organisms may be present and *unboiled milk should never be given to small children*.

What are the characteristics of good cow's milk?

The color should be whitish-yellow, not blue, nor red; the taste sweet and clean; the smell the pure unadulterated smell of milk. Gases are rapidly absorbed by milk, hence great care should be exercised in selecting the place of keeping it. The state here should show its control. The reaction is usually amphoteric, that is, it reddens blue litmus and blues the red. The fodder has some influence on this. The specific gravity varies from 1.029 to 1.033. Taking off the cream increases the specific gravity. It has now been clearly proved that the rapid or slow rising of the cream is not a good test of the quality of the milk. There are two practical methods of judging of milk: by the lactodensimeter and the lactobutyrometer. The first determines the percentage of water, the second the percentage of butter. The cremometer, as above stated, is not reliable. If the corrected (for temperature) specific gravity is more than one degree less than 1.029, we may conclude that the milk has been diluted with water. If it is higher than 1.033, the cream has been taken off. The simplest and surest instrument for determining the percentage of butter is the lactobutyrometer of Marchand. The procedure is simple enough to be trusted to any skilled officer. Instruments alone, however, will not suffice, the nose and the tongue must aid.

Now *the price*. This is important. Ordinary milk costs in Germany 18 to 22 pf. (4 to 5 cts.) a litre. Cure-milk costs about 50 pf. (10 cts.). The author acknowledges that this prohibits its general use, but suggests that it would be much cheaper for charitable institutions to help poor people get this milk than to take care of them when sick. Where there are no milk institutions, the milkmen should be urged to greater care and more earnest efforts to give the best possible milk. Dr. Albrecht closed with an earnest appeal on this point.

A most animated discussion followed.

DR. HOPPE first spoke. He claimed that, when the mother's milk failed, we should use absolutely nothing but cow's milk. Perhaps we shall some day find something which will render the casein more digestible. At present, there is nothing better for this than the barley or oat-water. He then described his milk stables in Hamburg, showed the amount and methods of adulteration of the ordinary milk and the insufficiency of the police control, and, then, by tables which are interesting, but too large to reproduce here, he showed the decrease in mortality under the use of his milk in certain sections of Hamburg, and especially in the foundling asylum. In using the ordinary milk, many physicians added no water, simply boiled it, and added a little sugar, alkali, or salt. The "control-milk," on the other hand, must be used *diluted*. H. goes according to the following scale: In the first week, one-fourth milk (milk-sugar added); gradual increase to one-third milk by the end of the fourth week; one-half milk up to three months; two-thirds to three-fourths milk to six months. After that, he adds one-fourth water still, the only objection to this being the frequent micturition. The milk is *always boiled*. When a good deal of urine is passed, and the child does not increase in weight, cream is added to the milk, as much cream, taken fresh, as will rise on the same quantity of milk as is in the child's portion, without boiling, except in the hottest weather, when the cream also should be boiled. In some few cases, he has used the milk warm from the cow without boiling it. The child's stools are the best criterion for the dilution of the milk. If they contain large lumps of undigested casein, either more water alone, or water and the cream (as above) must be added. Parents easily learn this, and it is the best safeguard against the diarrheas of children. Hoppe had never seen a case of transmission of disease from a cow, through its milk, to a child, but he admitted that the question was important.

PROF. THOMAS described a very successful milk-cure institution in Freiburg.

PAULCKE, a Leipzig apothecary, remarked that in spite of all that was said against artificial preparations, Nestle's meal not only was sold more than all others together, but was really an important article of commerce, and this, he claimed, was the fault of the doctors for recommending it. The speaker called him to order by saying that this would be discussed under the head of

diet for pathological conditions. Pauleke then presented a preparation of salts made by him to cause caseine to coagulate in fine flakes. It consisted of the best milk sugar and

16	parts of chlornatrium,
22	“ “ chlorkalium,
8	“ “ calcium phosphor.,
8	“ “ kalium sulphur.,
2	“ “ kali bicarbonic.,

with the addition of 0,005 acid, boricum. One packet (exactly twelve grm.) of this “milk-salt” is to be added to one quarter litre of hot water, and this added to the milk in the proportionate amount, according to age of the child.

BIEDERT (Hagenau) was listened to with interest while he spoke against the milk from the institutions as being too dear to reach the very classes who most needed it. The luxury of the stables was extravagance. He doubted the necessity of the dry fodder. Milk from mixed fodder may be perfectly good. In order to say with such peremptoriness that the fodder must be just this and no other, comparative trials should be made. Until then this is an arbitrary rule. He believes the breed of the cows and the management of the stables most important.

PFEIFFER (Wiesbaden) spoke of a modification of cow's milk in which the caseine is changed into a soluble peptone, called *peptonized milk*. If milk is rendered alkaline and digested with pancreatic preparations at a temperature of 40° to 50° R. (122° to 145° F.), it becomes thinner and yellow, and the cream separates easily. The taste becomes bitterish, quite bitter when the peptonizing is complete. The addition of acid to such milk will not coagulate it, as is also true of human milk. It was this which led him to try it. Two points had to be considered. First, as it spoiled rapidly, it had to be prepared fresh for each feeding. For this, A. Brunn, in Wiesbaden, made a pure preparation of fresh pancreatic juice from pigs, of which $\frac{1}{2}$ to 1 teaspoonful would peptonize 250 ccm. milk. From 100 to 250 ccm. milk, according to the child's age, was made alkaline by a little bicarbonate of soda or a drop of liq. potassæ, and $\frac{1}{2}$ to 1 teaspoonful of the pancreatic juice being added, was heated over a lamp or the fire till it boiled. The pancreatic juice only acts at a temperature of 100° to 150° F., but this gave it time enough and was the simplest rule. The second point was the *taste*. This may be so covered with a little sugar, or barley-water sweetened, that the children take the milk gladly. He claims that in using this, even for very small children, the feces showed absolutely no trace of the whitish cheesiness always found (?). He narrates cases to show the increase in the weight of children using it, and closes by recommending it most heartily.

HESSING (Augsburg) has a stable of fifty cows connected with his orthopedic institute. Under the strict use of dry fodder the cattle sickened. He believes the best plan is to use mixed fodder,

and at times to let the cattle graze, but it is a point of great importance to make no sudden change in the fodder. He offers himself (amid applause) to make experiments in feeding according to Biedert's ideas.

FÖRSTER (Dresden) would hold fast to the milk institutions. He also praises very highly the asses' milk, the only objection to it being the price.

EISENSCHITZ (Vienna) made a little break in the flow of argument by stating that he had obtained good results from condensed milk.

DEMME (Berne), whose name is familiar, showed a plan for a large milk-cure institute. He has found that cows sicken when allowed to stand in stall more than ten to twelve months. The Swiss breeds of cows, it is said, will sometimes become tubercular on a constant dry fodder. Demme also spoke enthusiastically in favor of asses' milk.

HENOCH (Berlin) remarked that the differences in the discussion were only on minor points, and due to differences in the material for observation. In large cities it is at present absolutely impossible to supply the poor with good cow's milk. Charitable institutions should be founded for this purpose. Scherf, an apothecary in Berlin, furnishes a peptonized milk from the Spreewald. It contains much fat, and tastes sweet. It is heated to 120° C., and is said to keep for months. Some that Henoch had kept for three months appeared a little flaky, but it was perfectly sweet, and the flakes were fat, and not caseine. The only disadvantage of this milk was its high price.

THOMAS had kept six bottles of Dornblüth's milk through the whole summer. It remained perfectly sweet, showing only small clumps of fat. He remarks on the importance of giving the newborn child absolutely nothing to eat, but putting it very frequently to the breast. If much sugar is given, it passes off by the kidneys.

LEDERER (Vienna) said, in opposition to the remark of Eisenschitz, that in Vienna the condensed milk was universally bad. "A good, equable cow's milk is the only food."

FÖRSTER (Dresden) believed that asses' milk would not be so dear if more of the animals were kept.

BIEDERT, in his caustic way, attacked those who attempted by the addition of lactic acid, various milk-salts, etc., to make the coagulation of the caseine *finer*, and who claimed that it was thus made more like human caseine. "I believe that right here, first of all, this superficial idea must be forever cast out of our study of nutrition." After many and careful experiments, he has come to the conclusion that this has but little to do with the digestion of the caseine. He gladly admits that the fine flakes of caseine are much less irritating than the large ones, "but that with the production of fine coagula alone all the differences between cow's milk and human milk are smoothed away, this ever-recurring declaration which pays no attention to chemical and physiological

conditions, this declaration never dare again, in a rational study of nutrition, to raise its head." He wished once more to state that he must not be misunderstood in regard to the milk production. "I also desire good breeds, good stables, and good fodder, but I am opposed to luxury, which increases the price of the milk without improving it."

After some further discussion by Soltmann, Flesch, Paulek, Kunze, Hoppe, and others, Dr. ALBRECHT, who read the report, concluded. He told how out of fifty dairymen around Neuchatel he had only found two who had not already been punished for adulterating milk. He related the difficulty he had in starting his milk institute, and its final success. "The 'cure' milk sells at the highest price. More beautiful, healthier cattle stand in no stable in the neighborhood, and these cattle eat only dry fodder." The only trouble is they cannot supply the demand. He closes by strongly recommending the milk institutions, and claiming that the dry fodder is necessary to keep the milk from varying.

This was the end of the first session.

On the second day, SOLTSMANN, after reviewing the work of the first day, began the discussion of the *means of preserving milk* by a description of the hot and cold methods and an exhibition of Bertling's patent apparatus for boiling milk. The object is to keep the milk in motion while it is thoroughly boiled. The apparatus is too expensive, and Soltmann showed a more simple one of his own which was approved by all present. It was simply a large cylinder, in which was fitted a smaller one with a funnel-shaped bottom and three openings in the top. The boiling milk passed up through the inner cylinder and down on its outside. If a little benzoate of soda is added to milk, and it is then thoroughly boiled, it is said to keep for months.

HOPPE used simply strong, well-corked bottles, which were heated in boiling water.

DEMME stated that the milk furnished by Scherf (before described) was preserved simply by overheating. He then discussed condensed milk. The principle of this is the drying of the milk in vacuum. The process is to dry the milk to one-third or even one-fifth its volume, heat it to 100° C. to kill any fungus it might contain, and then add thirty-eight to forty per cent of cane sugar to preserve it. It is this large amount of sugar which unfits it for food for children. A new factory in Vevey-Montreux is trying a different method. The milk is first heated to 100° to 103° C., then dried in vacuum at about 60° C., and then, without sugar, sealed up in air-tight tin boxes. Klebs advises that 0.5 to 1.0 of benzoate of magnesia should be added. Demme showed some of the milk, praised it highly, but again found the price too high. It should be diluted with *boiled* water in the following degree:—For children during the

First week,	$\frac{1}{2}$	teaspoon milk to 8 of water,
Second "	$\frac{3}{4}$	" " 12 " "
Third "	1	" " 16 " "
Fourth "	$1\frac{1}{4}$	" " 18 " "

administered every two or three hours. Such a decided schedule, however, should only be used after being proved by many trials.

PAULCKE again offered his milk-salt as a means of preserving milk, which induced BIEDERT again to remark, in opposition, that he did not believe it was a matter of no moment to be filling a tender child's stomach with a lot of salts.

The time being now used up, the rest of the discussion, with Prof. Thomas' paper on "The Transmission of Disease through Cow's Milk to Men," was postponed till the next year's meeting.

SOLTMANN closed thus: "Let us hold fast, gentlemen, to what we have already gained. Let us attempt in the future to put it in the power of even the poorest to obtain good, pure milk for his children. United work on part of doctor, experimental pathologist, physiological chemist, and land-owner can alone fill up the gaps in our knowledge of dietetics."

J. F., JR.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF NEW YORK.

Stated Meeting, October 4th, 1881.

CONGENITAL TEETH—MOLARS.

DR. A. JACOBI presented a variety of congenital tooth which he believed to be very rare. He had probably seen twenty children with congenital teeth, and in every instance heretofore the teeth were in the place of incisors, most of them in the place of the lower incisors. He said *in the place of incisors*, because he had not seen congenital teeth fully developed; they are always fragments without much root. In his book on "Dentition," published nineteen years ago, is an account of a large number of cases in which congenital teeth existed, and, wherever the location of the teeth has been referred to, they have been in the place of the incisors. On Wednesday last, a baby, two weeks old, was brought to his clinic, and it was found that it had two congenital teeth. One he removed at once, and it was the specimen presented. The teeth were not in the place of incisors, but in the place of molars, and they were the first congenital molars which he had ever seen. The tooth presented was very white, consisted of only the crown, had a very thin enamel, and exhibited four small points which appeared to correspond to what would have been roots had the tooth been developed later. It was in the situation corresponding to that to be occupied by the second molar of the lower jaw. A tooth corresponding to the specimen existed in the upper jaw, and would be

removed at his next clinic. Dr. Jacobi asked if any member present had seen congenital molar teeth.

DR. HUNTER had seen one child, delivered at less than seven months and imperfectly developed, which had a congenital incisor tooth. He had not seen a congenital molar.

DR. JACOBI thought such was not an uncommon experience. In his book several cases were reported in which congenital teeth were found in fetuses born prematurely. One of the old cases was of that kind, and at the same time it was said that a general eruption upon the skin existed, thus rendering it quite probable that it was a case of syphilis. The cases which he had collected were scattered through a period of about two thousand years. The first was from Pliny, who reports the case of a Roman consul who lived two hundred and fifty years before Christ, and had a full set of teeth at birth. Probably much of the story was an exaggeration. A number of such cases had been reported; but Dr. Jacobi knew of no well authenticated case in which a full set of teeth existed at birth. It might be added that, in a number of cases in which he had seen congenital incisors, the general condition of the new-born was a very unsatisfactory one. The infants were poorly developed, and some of them were fully rachitic. The presence of congenital teeth means abnormal development, either defective or a tendency to rachitis.

DR. MACKENZIE referred to a case in which the fontanelles closed at two months. He asked Dr. Jacobi if early closure of the fontanelles was common in connection with congenital teeth?

DR. JACOBI said that such a condition of the cranium might be expected with congenital teeth. This much, at all events, is known: that when the fontanelles close only, the teeth are apt to come early. When the fontanelles close at six or seven months instead of fourteen or fifteen, the teeth will usually have appeared at the third or fourth month instead of the seventh or eighth. With premature ossification, precocious development is uniformly seen; whereas in rachitic children it is uniformly retarded.

There is one peculiar condition and that is, when there is an abnormally precocious ossification of the cranial sutures and fontanelles, the upper incisors appear first, and not the lower, as is the rule. It seemed to him that what Dr. MacKenzie had observed was what might be expected.

MEMBRANOUS CROUP—TRACHEOTOMY—RECOVERY.

DR. LUSK narrated a case as follows: Early in the spring he was summoned to see a child sick with croup, one of Dr. O'Neil's patients. Taking a tube and instruments with which to perform tracheotomy, he hastened to the house, and, when he entered, the doctor told him that it was too late, for the child was nearly gone. Dr. Lusk went in, however, and found a child eight years old lying upon her mother's lap completely cyanosed, with pupils widely dilated, unconscious, and breathing only at long intervals. Tracheotomy was suggested, but Dr. O'Neil objected to its performance. The story was that the symptoms of asphyxia had appeared suddenly, and Dr. Lusk believed that in tracheotomy existed a chance of saving the life of the patient. It was decided to leave the question with the mother as to whether or not the

operation should be performed. After some hesitation she consented, and as rapidly as possible—the child being unconscious, no anesthetic was required—the trachea was opened and the tube inserted. The interval between the respirations was so long that grave doubt existed with reference to the child living until the operation could be completed. As soon as the tube was inserted, a forcible expiration threw shreds of membrane and blood fully two feet from the throat. Respiration was at once established; within a few moments color began to return to the face; within three or four minutes the child put its hand to its throat, opened its eyes, the pupils contracted, and inside of ten minutes she was recovered sufficiently to walk into the adjoining room. The tube remained in position five days. The patient made a good recovery.

DR. JACOBI remarked that the child in Dr. Lusk's case evidently was dying, and certainly would have died of suffocation within a very few minutes, and that was the indication for tracheotomy. He was very glad that he had been one of a very few who had performed tracheotomy in such cases, and he was also happy in the knowledge that scores of professional gentlemen are now as willing to perform it as he formerly was and still is. Doubtless, Dr. Lusk's case had done much to popularize the operation.

USE OF COLD BATHS IN SCARLET FEVER.

DR. LUSK asked concerning the use of cold baths in scarlet fever; and for the reason that, after removing a child from a bath at 80° F., the patient's condition was such that he was obliged to take active measures to bring about reaction. He had seen nothing of the good side of cold bathing in cases of scarlet fever.

DR. JACOBI replied that he could only repeat the warnings which he had given in many of his lectures, printed as well as otherwise, concerning cold bathing. He had seen as much harm as good done by cold bathing. His last printed allusion to the subject was in a lecture on typhoid fever in children, and published in the *Medical Record* (vol. xvi., p. 409), in which he insisted that the cold bath should be discontinued in every case where the extremities did not readily get warm. If the circulation is not restored immediately at a distance from the heart, the cold bath is contraindicated, as the object in view is not accomplished, for he had seen a number of instances in which the surface of the body appeared to be cool, while the rectal temperature was really higher than it was before the bath was given. When such is the case, he plunges the child into hot water. The temperature then falls in consequence of restoring the circulation of the surface of the body, thus enabling it to cool off. It has been his rule never to give a general bath a second time, when, after the first bath, the extremities are cool and the pulse has been increased rather than diminished in frequency. In such cases, he would use either the pack or the fever cot, as described. When the pack is applied from under the arms down to the knees, three-fifths of the body are covered, and that will suffice to reduce the temperature rapidly. Where the circulation is feeble, particularly where it is known that the temperature of the feet does not return considerably in a very short time, the cold bath should not be given. He had seen collapse occur under

such circumstances. The principle is, never allow the feet and legs to remain cold, for, if we do, harm is done with cold applications.

DR. CHAMBERLAIN asked Dr. Watts if, in the use of the Kibbee's cot, at the Roosevelt Hospital, any evidence had been obtained on Liebermeister's observation, that the liability to intestinal hemorrhage in typhoid fever was increased by the use of cold baths.

DR. WATTS replied that such had not been the case at Roosevelt Hospital. He recalled only one case of hemorrhage from the bowels, occurring during typhoid fever, and while the patient was receiving the water treatment, but that patient recovered. The water used, however, was warm, as already stated.

DR. JACOBI said that it was his rule to use cool or cold water in any case of typhoid fever where the temperature rose above 103° F., and he did not remember having seen a case of hemorrhage from the bowels for many years. But he had been careful in the use of cold water, and, if Liebermeister had adopted the cold-water treatment as a general plan in every case, he has buried many patients who should have recovered. The cases must be selected. Some patients seem to do well, while others do not, under the use of cold water. There are cases which appear to do well in the first week, and, after that, will not bear the water at all.

ABSTRACTS.

Prepared by J. FEWSMITH, JR., M.D., Newark, N. J.

1. Andrejew: Ligature of the Umbilical Cord (*Jahrbch. für Kinderheilkunde.*, XVII., 2).—DR. N. ANDREJEW'S work concerning the tying of the cord claims the interest, not only of obstetricians, but also of pediatricians, since it treats especially of the influence which is exerted upon the development and health of the child by the period at which the cord is tied. This question has already been discussed by Pollak and others, but Andrejew's article deserves recognition, both on account of the considerable number of his observations, and also because he has used great care in avoiding possible mistakes. His results coincide in general with those of other observers. His observations covered ninety-three full-term healthy children of healthy parentage, and nursed by the mothers. It was shown that the children in whom the cord was tied early (one to one and a half minutes after birth) suffered less physiological loss of weight, and more readily increased in weight than those in whom the cord was tied late—two minutes after the cessation of pulsation in it.

The same was true in the cases of twenty artificially-nourished children. Moreover, of the children with the cord tied early, all remained healthy till the eighth to the tenth day, while of the others about one-seventh became sick. The severer forms of icterus neonatorum were less often seen in the first than in the latter; the lighter forms unfortunately are not mentioned by the author.

The increase of blood which the child obtains by the late ligature amounts, according to Andrejew, to less than is estimated by Budin, Schücking, and others. It is only about thirty-eight grms.

2. Fœrster: The Use of Russian Baths for Diphtheritic Croup (*Jahrbuch f. Kindhilkde.*, XVII. B., 1 H.).—The use of steam in inhalation, in the room, etc., is not new in the treatment of diphtheritic croup, but there is no record of the use of steam baths, where the steam comes from outside the room, and the temperature is not too much elevated. As much as six years ago, the author extemporized Russian baths in his private practice, and got quite favorable results. In 1878, in the New Dresden Children's Hospital, rooms were provided for the purpose.

The cases of diphtheritis which come to a hospital are of the worst kind, and give a large mortality. Out of 179 in this hospital, 93 or 51½ have died. Many were brought in simply for tracheotomy, many already asphyxiated. In 72, tracheotomy was done; in 57, immediately or on the day of reception; in 7, on the next morning.

129 baths have been given to 43 different patients. The bath lasts half an hour. The temperature of the room is from 84° to 100° F. The bath was only used when the symptoms of stenosis were well marked; in most cases, there was membrane in the pharynx and often albuminuria. The diagnosis of false croup was clearly excluded. The result differed according to the period of disease at which the bath was given. As a rule, it did little or no good when the stenosis had already existed one or more days.

The results were also unfavorable in cases where the stenosis recurred after a tracheotomy.

The proper time for the use of the steam bath is just at the beginning of the acute narrowing of the air passages. Even here it is necessary to exclude certain cases. Great weakness, a very frequent pulse, a tendency to hemorrhage, a very high temperature, and severe complications in the lungs are all contraindications. The temperature rises during the bath from $\frac{1}{2}^{\circ}$ to $2\frac{1}{10}^{\circ}$ C. The highest temperature at which it is safe to give a child a bath is 39° C. in the axilla. The field of use for the baths, therefore, becomes quite narrow, but it still exists. No severe accidents follow their use. In favorable cases, the ease given by them was most marked. The children treated received from two to thirty-one baths. The greatest number in one day was four. The usual other treatment vapor of lime-water, etc., was given in addition.

Out of 22 cases in which the stenosis developed in the hospital, 6 were not considered fit for the baths: 1 got well without them—an important fact in estimating their benefit—4 had to be tracheotomized (probably because the baths were postponed too long), and 3 were saved by the baths without tracheotomy. This is a modest result, but, in so deadly a disease, the author considers it as worthy of consideration. He gives several cases in detail.

3. Lee: Diagnosis and Treatment of Pertussis (*Lancet*, July, 1881).—DR. ROBERT LEE holds that whooping cough is a very ancient, an exceedingly frequent, and quite fatal disease. In 1678, there was a mortality in London of 20,471, among which were one case of whooping cough and two of chin cough. For fifty years afterward, these two were registered separately. In 1730, they were merged, and the mortality was 152 in 27,000, or 1 in 177. This gradually increased till it reached 1 in 29 for London, and now it is even higher. Has the disease actually in-

creased, or have we only been slow to recognize it? After years of observation, the author concludes that pertussis gives us among the poorer classes over ten per cent of all cases treated. His first point is that it is much more prevalent in infancy than is generally supposed. He is satisfied that if a nursing infant is confined in a room with a case of pertussis—even if only a few days old—its age will not protect it, and that just as the mortality from whooping cough among children is greater before the age of twelve months than later, so the occurrence of the disease is more general. The author thinks there is no question as to the infectious character of pertussis, and classes it with the fevers, such as scarlatina and measles, rather than with the spasmodic nervous diseases. He then reports twenty-one cases to show the difficulty of diagnosis and the length of time necessary often for the development of the characteristic symptoms. He considers thirty-two days to be the period usually elapsing between exposure and the well-marked symptoms, though obscure symptoms may precede these for ten days. In some cases, a second attack does take place, but this is always the result of long and constant exposure to the infection. One fact which often prevents a diagnosis of pertussis is that the “whoop” is regarded as a necessary symptom. Without fear of exaggerating, the author states that infants with pertussis *rarely* whoop. He is surprised when the whoop occurs in a young child, and more surprised that we should expect it to do so. Many practitioners now recognize this. Years ago Cullen wrote: “I have had instances of a disease which, though evidently arising from the chin-cough contagion, never put on any other form than that of a common catarrh.” And, again: “When the disease, beginning in the form of a catarrh, is attended with fever and difficult breathing and with little expectoration, it often proves fatal, without taking on the form of whooping cough.”

Now this is the form which the disease does assume in very young children, and which quite accounts for its being so dangerous in early life. It is not quite correct to say that it begins in the form of a catarrh. The disturbance of the system is more serious, and, if the question is asked of the parents whether the child has been exposed to cold, it is generally answered in the negative. The symptoms are those which more or less characterize the contagious maladies in their early, though rather indefinite stage. The most marked certainly are refusal of food, prostration, restlessness, and loss of flesh, with more or less increase of temperature and quickness of respiration. We are inclined at one time to suspect pneumonia or capillary bronchitis, at another, that the cause of the symptoms is dentition, or, if they are not severe, that they are due to some error in feeding. There is a symptom which is a serious and frequent one in infants, and that is the occurrence of active diarrhea. It is true that the diarrhea is often preceded by vomiting; but, as a rule, when the diarrhea begins, the other symptoms abate, and one of two events occurs: either the infant succumbs, in spite of all treatment, or the disease appears to exhaust itself, and the symptoms do not return. The active treatment with purgatives, recommended by Sydenham, appears thus to be indicated to some extent by nature. Sir Henry Holland pointed out the probable relations between whooping cough and what used to be called infantile remittent fever, and distinctly expressed the opinion that they would be found to depend on the same

active cause. The symptoms usually are more severe at night. Crowding of cases seems also to increase their severity.

In regard to treatment, the author makes no really new suggestions. He believes in the inhalation of carbolic vapor, in tonic and stimulant treatment of the diarrhea, and in many cases in the use of cod-liver oil with quinine and iron.

4. Day: Tubercular Meningitis (*Lancet*, July, 1881).—At the meeting of the Medical Society of London, Dr. Day read a paper "On Tubercular Meningitis and the Mode of Treatment." He commenced by asking two questions: 1. At what stage of the disease could its nature be surely recognized? 2. Is its progress affected by treatment? The premonitory symptoms were essentially febrile. Then might come on varied grave signs with great rapidity, when, perhaps, the disease in its early symptoms had been mistaken for typhoid fever, or some other ordinary disease. An abstract was made of five cases. The first was that of a very young child who had in the course of the disease suffered no sickness. The second case was that of a child nine years old who had been ill twenty days, but had never suffered from vomiting. The pulse, respiration, and temperature had rapidly mounted just before death. The autopsy revealed general tubercular infiltration. The third case was in a child two and a half years old. In this case also there had been no vomiting, but there were flushings of the face and convulsions. Early on the day of death the temperature was 99° , but towards evening it had risen to 105° . In the fourth case, a child of four years, there had been no vomiting; but in the fifth there had been both constipation and vomiting. Of all the cases this was the only typical one, though the temperature never rose above 101° .

Dr. Day did not regard optic neuritis as a great aid in making the early diagnosis. Congestion and haziness of the optic discs might be more frequently discovered, though it was by no means easy to make a satisfactory ophthalmoscopic examination in an irritable, restless child.

As regards the treatment of these cases, he would rather ask for suggestions than attempt to give any. Cold to the head often gives relief; iodide of potash he had never found to be of any avail. He thought that the reported successful cases of "tubercular" meningitis were really instances of simple inflammation.

Dr. S. Mackenzie said it was often impossible to make a diagnosis in the early stage. He regarded a high temperature as a sign of impending dissolution. Irregularity of the pulse and retraction of the abdomen were important symptoms. In his opinion, a few cases of undoubted tubercular meningitis did recover. Iodide of potash and mercury were his usual remedies.

Dr. Althaus said that a heightened temperature with a slow pulse were important aids to diagnosis. He advocated cold applications to the head. Dr. Green regarded the pulse as probably the most important aid in making a diagnosis—it was very irregular both in rhythm and force. Dr. Lee advised caution in making a diagnosis, for many cases presented but the general and ordinary symptoms of cerebral disturbance. Experience had led him to the conclusion that true cases of tubercular meningitis do not recover. Ptosis was a most characteristic symptom. Dr. Gilbert Smith mentioned the marked difference in the pulse-rate when the child

was lying down and when standing up. The ophthalmoscope was of great use in the later stages of obscure cases. Dr. Croker alluded to the ease with which a few tubercles may escape observation on a post-mortem examination. Dr. Day briefly replied. In his opinion no case of true tubercular meningitis recovered.

5. John Colston: Observations on Pertussis (*Lancet*, August).—In connection with the abstract already given of Dr. Robert Lee's article on pertussis, I give the following statements of Mr. Colston, entirely omitting his cases and the arguments by which he reached his conclusions. Whooping cough is a disease produced by a peculiar blood poison which is absorbed and exhaled by the bronchial and pulmonary mucous membrane; therefore it is highly contagious, the air of the sick-room and the evacuations and perspiration of the patient being charged with the poison. It is not a disease peculiar to childhood, but attacks all ages, though most common among children—"indeed, I have known them born with it, the mothers having suffered from it for some time previous to their confinement." It is both endemic and epidemic. The poison may appear in many forms, but generally takes the form of catarrhal pneumonia, particularly in children. It may attack a person exposed to infection at once as acute pneumonia, meningitis, etc., or may lie dormant in the system even for months, producing merely slight weakness till called into action by cold, change of air or weather. A person may have an attack in winter, appear quite free from it during the following summer, but on the approach of winter again it returns. In all the forms which this poison takes, there are distinct exacerbations from about 4 P.M. to about 8 or 9; then again from 10 or 11 until 5 or 6 A.M., after which time the patient may feel better until afternoon. The exacerbations vary according to the part most affected by the poison; if the lungs, there is more cough, greater dyspnea, often accompanied by disordered action of the heart simulating heart disease, but which arises from the circulation through the lungs being impeded by their congested state; if the brain is most affected, delirium is more violent, often more vomiting and diarrhea.

There is another peculiarity observed in patients suffering from pneumonia: the stools are occasionally almost white, as if the mucous coat of the hepatic and common ducts were affected in the same way as the pulmonary mucous membrane, and occluded for a short time by mucus. The pneumonia may also be preceded by convulsions, and seems to have a preference for the left lung.

The gravity of whooping cough is not generally known or acknowledged, and if brought before some members of the profession is scorned, either because they cannot understand or do not care to investigate it. Sic, Mr. Colston.

6. J. G. Barford: Mistaking Small-pox for Chicken-pox (*Lancet*, August).—This is the heading placed by the editor of the *Lancet* over a letter from Mr. Barford relating three instances of what he calls the "co-existence of small-pox and chicken-pox." While there can be at the present day no doubt as to the possible co-existence of two or even more of the acute diseases in the same person, there may be some doubt as to the following cases. I simply give them as recorded.

A boy, in a school of four hundred pupils, developed a rash, partly vesicular and partly papular. The vesicles were in shape, and every

other particular, good examples of chicken-pox vesicles; they withered scabbed, and peeled off, leaving no marks behind them; but the papulæ went on into pustules. and, instead of drying up as the vesicles had, they sloughed out bodily, just as John Hunter says they should do when he asks, "What is the true characteristic of small-pox? That by which it differs from all other eruptions which we are acquainted with. The most certain character of the small-pock that I know is the formation of a slough, or a part becoming dead by the variolous inflammation." The only peculiar feature in this first case was that each pock was small, but otherwise perfect. The vesicles were ovoid, and might have been taken, had they existed alone, as typical examples of the vesicular tears of chicken-pox. In this case the vesicles were, numerically, about two-thirds, and the pustules one-third of the whole.

A second case arose in a boy who had been brought into proximity to the first during the incubative stage; but it differed from the former in that the chicken-pox vesicles greatly preponderated, and only a few points showed the characteristic sloughing.

A third case showed the same medley of rash, but in different proportions, for there were three-fifths of modified small-pox and only one-fifth of chicken-pox. The cases were all carefully isolated, and no others occurred in the school. A fortnight later, when the boys had gone home, two cases of simple chicken-pox were reported by another physician. Without doubting this diagnosis, taken in connection with the second case, could not these cases have been an offshoot of the others? If so, they raise the question, Are small-pox and chicken-pox modifications of the same disease? That they may co-exist is beyond doubt; but are they mutually convertible?

7. A. Jacobi, M.D.: Anemia in Infancy and Early Childhood (*Archives of Medicine*, February, 1881).—Pathological processes are but the utterances of physiological functions performed under abnormal circumstances, and these functions depend upon anatomical conditions. The dependence of special morbid processes upon the anatomical predisposition of certain organs is often unheeded. Every treatise upon disease should begin by stating the normal anatomical conditions of the part affected. For instance, the normal tendency to loose evacuations from the bowels in infancy depends in part upon the conditions of the intestinal tract.

Peristalsis is very active, the blood-vessels very permeable, and the transformation of surface cells very rapid. The peripheric nerves are more superficial, and their terminations proportionately larger than in the adult. This latter fact, with the greater size of the anterior horns, accounts for the greater reflex irritability of the young under intestinal and other influences. Besides, the sphincter ani acts with less power, the feces are not retarded, and no time is afforded for the absorption of their liquid constituents. Moreover, acidity often occurs normally in the small intestine, and causes the formation of purgative salts.

On the other hand, constipation in the young is sometimes due to a gross anatomical condition of the intestinal tract. In these cases a very great development of the descending colon is met with, especially in the sigmoid flexure. The increased curvature thus given to the bowel sometimes retards and occasionally prevents the passage of feces. Two other instances well illustrate the same point at a later period. One is the

dependence of rachitis upon the abnormally large condition of the blood-vessels, and consequent low blood-pressure which favors the growth of the epiphyses. The enlarged and active liver forms cholesterin copiously, which is important in establishing hyperplasia of the cartilage cells. Thus ossification becomes irregular and defective, and fat is deposited in excess, while the assimilation of lime is deficient.

Again, in scrofula, we find that the size of the heart, relatively to the lungs, is diminished. This circumstance, coupled with an acquired debility of the nervous system, results in an insufficient supply of blood both to lungs and organism, and in defective oxygenation, especially in cases of torpid scrofula, in which the lymphatic system is very active.

The blood of the new-born differs greatly from that of the infant at a period but little advanced. The hemoglobulin in its venous blood amounts to 22.2% of the whole solid constituents, while in the mother the percentage is but 13.99. But the new-born child has less blood than the adult, the ratios to body weight being as 1:19.5 and 1:13 respectively. But these proportions at once change. The hemoglobulin at once diminishes, so that at six months it amounts to but 55% of its original quantity. From this time it gradually increases to 58% at the fifth year, to 64% during youth, and to 72% in adult life.

Again, the infant has and requires more blood than the adult, but this blood has less specific gravity, less fibrin and salts, less hemoglobulin and solid albumen, and more white blood-corpuscles. The large arteries at birth and in infancy are wide, and the blood pressure consequently low, and in the first five years this is seen mainly in the subclavian and common carotid. This is the period of rapid growth. The brain doubles its weight in one year. The peripherious vessels grow in proportion to the large ones. Toward the seventh year the heart grows, perhaps to overcome the sluggish circulation. It is smallest with large arteries in the first year, particularly the second half, at the same time that growth is most intense. Thus, growth and low blood-pressure go hand in hand. Water prevails in the organs to a greater extent than the smaller specific gravity of the blood appears to justify. The blood-supply to the lungs at this time is increased, and they begin to rival the liver in size. The labor required of them and of the heart is greater than in the adult. In him they provide for sustenance simply; in the child, for growth as well.

During the first year the latter attains to three times its original weight. Thus fatigue is more easily experienced, and the necessity of sleep readily explained. Further, metamorphosis of matter is not controlled by the inhaled oxygen alone. Its intensity certainly depends in part upon nerve influences, as the predominating development of the medulla oblongata, anterior horns, and trophic nerves attest. All this exertion, almost over-exertion, compared with the requirements of the adult system, is at the expense of a blood which contains less solid constituents than his. Thus the normal oligemia of the child is in constant danger of increasing from normal processes, while the slightest mishap promotes this tendency. And, as diseases are so frequent at this period, cases of anemia are met with in every day's practice.

Anemia may be idiopathic, but in the vast majority of cases is symptomatic, and cannot rationally be treated without recognition of its causation. Every disease may give rise to it. Sometimes hemorrhages, melena, umbilical hemorrhage, hemophilia, purpura, etc., cause it. As a rule, acute anemia is more readily overcome than the chronic form.

which undermines the vitality of organs while it robs them of nourishment. These cases recover slowly or not at all. Thoroughly anemic and delicate babies seldom get entirely well. The recruits of the Prussian army, born in the starvation years of 1816 and 1817, were of a very inferior character physically. To this class belong children born prematurely, those whose mothers are delicate or have disease of uterus or placenta, or have suffered much during pregnancy or lactation, and children born with congenital affections, including the peculiar smallness of the heart and arteries, to which Virchow attributes many cases of chlorosis. After birth, anemia may depend upon endocarditis which is not rare, and is more frequent in the articular rheumatism of the young than in that of the adult. Acute rheumatism in them is very frequent, and comprises most cases of so-called growing pain, while it usually gives but little joint swelling. Protracted diarrhea is more dangerous than constipation. The intestinal membrane undergoes inflammatory changes, and if the affection continue, the lymphatic glands become indurated or caseated. These gland changes are apt to remain and deteriorate sanguification for the future.

Malaria is too often diagnosticated, and again its influence is frequently overlooked. It is apt to be irregular in development, and is often concealed by accompanying symptoms, as convulsions. It may cause intense anemia and enlarge the spleen considerably before ever inducing a real attack. Other causes are chronic nephritis, leucocythemia, sleeplessness, syphilis, rachitis, fatty liver and enlarged lymphatic glands, scrofulous conditions and diseases of the lungs, pleuræ and bones. Two cases of pernicious anemia in children are on record.

In anemia, the skin and mucous membranes are pale, of a yellowish hue, thin and flabby. Apparent elasticity of the skin and underlying tissues is noticed only in cases of edematous effusion. The tissues least in use emaciate first. These are, in very young children, fat and muscles. But cases occur in which fat is persistently retained and often increased. This is the product of incomplete combustion, due to deficiency of red blood-corpuscles, and therefore of oxygen. As a result of the loss of muscle, these infants are readily fatigued and become irritable. The nervous system is less affected than any other because of its rapid development at this time. Babies who are emaciated and anemic are often in the best of spirits because their brains are in comparatively good condition. The brain emaciates less rapidly than other parts of the body, so the depression of the fontanelles during the first year denotes an unusual degree of emaciation elsewhere, and, when considerable, indicates a dangerous degree of inanition. Murmurs in the jugular veins are not frequent, but in the carotids and over the large fontanelles they are not rare, and are found whenever the cranial blood-pressure is diminished. The heart seldom exhibits functional murmurs; when murmurs are present it is safer to consider them as being organic.

Although the brain be less liable to emaciate than other organs, there are still some cases in which headaches, syncope, and sleepiness or sleeplessness and hysterical attacks result from anemia alone.

The pulse is unreliable at this age. Circulation is deficient, and hence the secretions are altered, and appetite and digestion are impaired. Its sluggishness and insufficiency, together with the watery state of the blood, are apt to induce catarrhs of the respiratory organs. The walls of the blood-vessels become thin and degenerate, so as to permit of transu-

dations or even extravasations. Thus less resistance is offered to disease, and the slightest tendency to effusion or exudation is promoted.

The predisposition to anemia in the child is therefore very great, and is most marked at the time of most rapid growth. Nurslings are more exposed than older children. In them insufficient and improper food are frequent causes. Infants whose mothers have not enough milk simply starve. As long as muscles and lungs hold out, they simply scream. This condition is recognized by the absence of local disease and by the paucity of normal feces. Many a case of alleged constipation is one of starvation. Improper food is a much more frequent and dangerous cause. Nursing during pregnancy, or unduly protracted, or when the mother has communicable disease or great anemia, should be forbidden. Avoid solid food, and use no cow's or condensed milk without the addition of some gelatinous or farinaceous decoction, barley, oatmeal, gum arabic, or gelatin. In anemia, give beef-soup daily in addition. Solid food may be begun at the end of the first year. Complete hygiene, at home, at play, and at school, must be enforced. Out-door play is necessary. Too many books are bought for Christmas and too few skates.

The utility of iron as a restorative has not been decided to the satisfaction of all. Many cases get well without it, and again in some it is absolutely unavailing. There is also plenty of it in almost every article of food. One and a half grains are thus taken and eliminated daily. But it is still a question whether it does not improve the chances of recovery. The doses given would certainly be too large, compared with the amount contained in the ingesta and blood, only fifty grains in all. It may act otherwise than by increasing the amount in the hemoglobin. The best preparations for the anemia of children are the lactate, tincture of pomate, iodide, pyrophosphate, subcarbonate, and the tincture of the chloride. The iodide, besides combining an absorbent influence, prevents fermentation in the stomach by liberation of iodine. The subcarbonate is mild, and may be given in larger doses (3-7 grains daily) than the others. Combined with bismuth and soda, it acts well in the gastric catarrh which is often present. The tincture of the chloride is a vascular irritant, and is most beneficial when the heart's action and the blood pressure are diminished. The pyrophosphate acts well when, beside gastric catarrh, the indigestion extends to the upper part of the small intestine. The compound hypophosphites and phosphates, though rapidly eliminated, produce happy effects.

All these preparations are of special value in chronic anemia. Acute anemia, such as follows hemorrhage, is rare in children. The doubtful results of transfusion upon a large scale have induced a modern writer to make small transfusions with a hypodermic syringe. This plan seems rational, but time must decide the question of its utility and safety. In chronic anemia, arsenic is beneficial, especially in indigestion due to want of nerve-power and gastric juice. Small doses (2 to 5 drops daily of Fowler's solution), well diluted, seldom produce gastric derangement. Strychnia ($\frac{1}{100}$ grain daily to child of two years) acts well as an adjuvant to iron or arsenic, and may be continued for some time. Phosphorus in minute doses ($\frac{1}{100}$ to $\frac{1}{200}$ grain daily) is useful in acute and chronic diseases of bone, particularly caries.

In many cases cod-liver oil is serviceable, but it is not well borne in summer, and should not be given when indigestion or gastric catarrh is present.

8. Gray: The Effect of Genital Irritation in the Production of Nervous Disorders (*Annals Anat. and Surg.*, Jan. and Feb., 1882).—DR. LANGDON CARTER GRAY read before the November meeting of the New York Neurological Society an interesting article, in which he endeavors to place on a better basis our knowledge of reflex nervous manifestations. He opens by showing how easy it is to start a new fashion in medicine—a fact which to-day it needs no lengthy argument to prove. Easy as it is to start a new idea on its rolling road, just so hard is it disodge such an idea from men's minds, even professional minds. "Error, fleet-footed, speeds its way, while truth comes tardily after, if it comes at all." The history of the question of reflex paralysis illustrates this. By reflex paralysis is meant one dependent on irritation of some peripheral nerve, either of the internal or external tissues, which is attended by no structural alterations visible to the microscope, and which is relieved by the removal of the irritation.

The author reviews the literature of the subject, showing how Stanley (1833) reported cases of paralysis which he called reflex because there were marked lesions of the genito-urinary apparatus, and none of the nervous system apparent to the naked eye; how Stanley's idea was received and fostered by distinguished writers in England, France, and all Europe, and how it was not till twenty-three years later Sir W. Gull (1856) called attention to the weak points in Stanley's papers, and again in 1861 wrote more forcibly against his position that the tide turned in the other direction. Physiology, the microscope, and closer pathological research carried almost all opinions over now to the other side of the question; Brown-Séquard alone stepping forth, as late as 1873, as a champion of the old doctrine.

In this country, the question has assumed a slightly different phase. In the cases above mentioned, the causes of the paralysis were sought in the kidneys, bladder, prostate, urethra, uterus, or intestines. During the last decade, Dr. Lewis A. Sayre, in articles published in 1870 and 1875, has claimed that "phymosis, adherent prepuce, and irritable clitoris are frequent causes of paralysis *in children*, of retention of urine, and of many slighter nervous disorders." It was before this that Dr. I. Baker Brown had been expelled from the London Obstetrical Society for performing clitoridectomy for cases of epilepsy, hysteria, etc. In 1868, Mr. Bryant, and, in 1872, Mr. Barwell reported cases of nervous symptoms in children relieved by circumcision. Dr. Otis seconded Dr. Sayre's theory. The matter has attracted such wide-spread attention and such wonders have been claimed for it that Dr. Gray claims that it now merits our "critical examination."

In the first place, what evidence is there that genital irritation causes paralysis? This should be found in the reported cases. These the author now critically reviews, and sums up—it seems to us justifiably—as follows: Out of twenty cases of alleged paralysis from genital irritation, in *not one* is the proof conclusive. In two cases, there is some proof; in two there was impaired locomotion, probably from the *pain*; in four others there were other evident causes for the paralysis, and, in twelve, the histories were too incomplete to render any opinion justifiable. The author has written to the most distinguished neurologists of this country, asking if they had ever seen a case of paralysis from genital irritation in which the proof of the facts was conclusive, and they have all answered

positively in the negative. In view of these data and his own experience, Dr. Gray concludes that genital irritation cannot cause paralysis, or does so very rarely. He then goes on to show, from some of Dr. Sayre's cases, one of Barwell's, and four curious cases of his own that "the operative procedures necessary to the relief of phymosis and adherent prepuce often cause considerable temporary improvement in cases of organic nervous disease, especially in the later stages." Several factors may be potent in effecting this. There is the rest, though this is short; the effect of anesthesia; the effect on the nervous centres of the cutting, or tearing, or cauterization of the operation itself—a factor which is of very great weight. The author then shows that it is probable that slight nervous disorders, especially of the urinary apparatus, *may* depend on irritation of the genitals, also that many instances are recorded in which he cannot deny that other peripheral nervous irritation has caused paralysis, and, therefore, he comes, by a very careful series of arguments, to the following conclusions:

1. There is no proof that genital irritation can produce a reflex paralysis.

2. While it is probable that slight nervous disorders, as incontinence, retention, difficult micturition, erratic movements, and slight nervous disturbances can be produced by genital irritation, the proof is not yet complete.

3. Operations for the removal of genital irritation may be beneficial even in organic nervous disease.

4. We should, therefore, remove such genital irritation, if it exist, in any case whatsoever, and thus give our patients the benefit of the doubt.

5. In all cases of nervous disorders, with accompanying genital irritation, we should not regard the latter as the cause of the former until all other probable or even possible causes have been rigidly excluded.

6. Operations upon the genitals, even when there be no genital irritation, may prove to be a useful therapeutic measure in certain cases.

Since Dr. Gray read his article, the *Record* has published further cases by Drs. Sayre and Seguin, which Dr. Gray now analyzes, and claims as supports of his position. He also calls attention to two cases reported by Dr. C. L. Dana, in one of which no improvement followed circumcision until other vigorous measures had been employed, and, in the other, no circumcision was done, and the same remedial measures effected a cure.

9. Pott: Vaccination with Aseptic Virus (*Jahrbch. f. Kindhklde.*, XVII. B., 3 u. 4 H.).—DR. RICHARD POTT details in great completeness a series of experiments in the use of vaccine lymph, claiming to prove the fact that "the activity and the protective power of humanized vaccine lymph is not altered by combination with aqueous solutions of various antiseptics."

Thymolized lymph (1 part lymph and 2 parts of thymol solution, 1:1,000) was recommended three years ago by H. Köhler, and, though it has not received the notice it deserved, has been very successfully used in the vaccine institution at Halle ever since. In the preceding summer, the author used it in twenty-eight cases. Of these, two were secondary, one of which was unsuccessful, as it afterward was with vaccination direct from arm to arm. The others were all successful, and from them

forty other children were successfully vaccinated. Experiments have not, up to the author's date, been made with lymph rendered aseptic by other antiseptics, such as salicylic acid, boracic and carbolic acids. This the author has now done. The combinations used were as follows:

1. Salicylic solution	1.0:300	} and fresh humanized virus, ää.
2. Boracic "	3.5:100	
3. Carbolic "	1-5:100	

These watery solutions and the fresh lymph were mixed thoroughly with a glass rod on a clean object glass, and then either immediately used or drawn into capillary tubes and sealed for later use. Bretonneau's tubes were used, and not more than three children were vaccinated from one tube. The author gives tables, showing in detail the progress of a large number of cases, the periods of development of the pox, the temperature, etc.

In using the first two solutions, no difference was observed from the course of ordinary lymph. With a three per cent and four per cent carbolic solution, the pox developed two days later. The five per cent carbolic solution was inactive.

Vaccination from the arms of these cases was uniformly successful. In some cases, the children were vaccinated on one arm with the carbolized (one per cent) lymph, and on the other with animal lymph, and it was found that the pocks from the latter matured later, were not so large, and not nearly so well filled as those from the former. They were also not so effective in further vaccination.

The five per cent carbolic solution seems to destroy the vaccine virus itself, and is absolutely inactive. The advantages of the aseptic lymph are:

1. Any erysipelatous virus in the vaccine is probably destroyed.
2. Aseptic lymph may be preserved in good condition for years.
3. It is thinner, contains no fibrinous coagula, and with it twice as many children may be vaccinated as with the undiluted lymph—a circumstance of some importance in the present large demand for vaccine. The author regards it as to be recommended above all other forms of vaccine.

10. Dr. Oscar Silbermann: The Origin of Eccentric Hypertrophy and Acute Dilatation of the Left Ventricle in Nephritis Scarlatinosa (*Jahrbch. f. Kindhlkde.*, XVII. B., 3 H.).—Within the last decennial, no question of internal medicine has been subjected to more active discussion than nephritis. The pathology of the kidneys and the relation between nephritis and cardiac hypertrophy have engaged the greatest pathological anatomists of the time. Yet the interest has centred principally in chronic morbus Brightii, and it is really strange that acute nephritis or its parallel, scarlatinal nephritis, has not been brought into consideration in the question. In foreign and German literature, almost nothing is to be found upon the relation of these to cardiac hypertrophy. The author here discusses in full the literature of the subject, and finds that Friedländer is the first who has directed our attention to cardiac hypertrophy in scarlatina.

In the anatomical examination of numerous cases of nephritis scarlatinosa, Friedländer found as a regular, indeed, a never failing con-

dition, a considerable hypertrophy of the heart combined with dilatation—in some cases alike on both sides—but in most cases more strongly developed upon the left side.

The dilatation was always marked and striking. To prove the hypertrophy, numerous observations upon the relation of the weight of the heart to the body-weight were made. Here follow tables from Friedländer and Beneke. From these it appears that the average increase of cardiac weight in children dying from nephritis scarlatinosa amounts to about forty per cent (in some cases very much more), while in adults there is scarcely any increase. In children dying from scarlatina without nephritis, there was no cardiac hypertrophy.

Friedländer also describes the anatomical condition of the kidneys, and claims that three factors enter into the causation of cardiac hypertrophy. These are:

- | | |
|---|-------------------------|
| 1. The destruction of the capillary circulation in the kidneys. | } According to Traube. |
| 2. The decreased elimination of water. | |
| 3. The retention of urea and other constituents of the urine. | } According to Senator. |

Without discussing these theories, the author agrees with them, and proceeds to his own experience, which extended to five out of thirty-six cases of scarlatina. This small epidemic was nevertheless a severe one, eleven or thirty per cent of the cases having died, and the temperature having been extremely high in all. Autopsies were made in four cases which were observed from the very beginning of the disease. In two of these, there was enormous left cardiac hypertrophy; in one a very considerable dilatation of the left ventricle. The author then relates three cases in which exquisite cardiac hypertrophy arose in a period not longer than one week, and explains this by the following causes:

(1.) In no other acute nephritis is the elimination of water so suddenly and so decidedly decreased as in scarlatinal nephritis; hence, the increased tension in the arterial system, according to Traube.

(2.) In scarcely any other form of acute nephritis is the tissue of the kidney so extensively and so completely affected as in nephritis scarlatinosa, which, indeed, explains the sudden cessation of the secretion.

(3.) According to the observations of Klebs, Friedländer, and others, the participation of the glomeruli in scarlatinal nephritis is especially marked, and, hence, there results, on the one hand, a closing of the glomerular loops, and, on the other, an excessive limitation of the circulation in these capillaries.

(4.) It is most probable, on account of the enormous œdema of the skin, that the cutaneous capillaries are compressed, and this also causes increased pressure in the aortic system.

(5.) Finally, there are physiological points to explain this rapid hypertrophy. Beneke has shown that while the heart of the new-born child, as compared with body-weight, is at its maximum, and while during the first and second years it sinks to its minimum, from the third to the seventh year, on the other hand, it again rapidly increases. Gerhardt has also shown that the heart between the third and eighth year is relatively greater than the adult heart—that is, there is a moderate

physiological hypertrophy of the left heart in children between three and eight years of age. Finally, the child's heart acts much more rapidly than the adult's, but not so strongly, and the blood-pressure in the aortic system is much less in children, so that with any considerable resistance in the aortic system hypertrophy is easily acquired.

Yet in spite of all the physiological conditions necessary to the origin of a left cardiac hypertrophy in childhood, under certain conditions, as the author shows, there arises no hypertrophy, but an acute dilatation of the left ventricle. Such observations appear very rare, but the author gives two cases which seem to support his point. Three questions are then to be answered:

1. Under what circumstances in nephritis scarlatinosa do we find acute dilatation without hypertrophy of the left ventricle?
2. How does this dilatation develop so rapidly and so markedly?
3. How is this acute dilatation characterized, and how differentiated from the hypertrophy which always begins with dilatation?

1. We must search for the explanation of this question in the condition of the cardiac muscles. These are apparently—whether through anemia or through the scarlatinal process we cannot say—functionally severely injured, and therefore relatively incapable—that is, they may accomplish their normal action, but cannot meet the increased demand made upon them. Had they been capable of this, a compensating hypertrophy would have taken place in them.

2. In no disturbance of the circulation does the heart suddenly have to overcome such obstructions as in nephritis scarlatinosa, and in none is there such high arterial tension. To overcome this, hypertrophy must be rapid and considerable. If now, in consequence of comparative functional insufficiency of the cardiac muscles, this compensating effect fails, blood must gradually collect in the left ventricle, and cause an enormous distention of its cavity.

3. To answer this question, the author refers to his cases, and we omit his account, as the question is answered in the following conclusions of his whole article.

I. In the course of nephritis scarlatinosa, we may have an eccentric hypertrophy of the left ventricle.

II. If from any cause whatever the cardiac muscle has become relatively functionally insufficient, we find, instead of eccentric hypertrophy, acute dilatation of the left ventricle.

III. Whether we have hypertrophy or dilatation of the left ventricle, in every case the disturbance of compensation begins with a dilatation which is first clearly noticed at the apex.

IV. The murmur over the mitral valve is only temporary when we have a compensating cardiac hypertrophy, but continues until the occurrence of death when there is only acute dilatation.

The author hopes that his researches will lead to others, and that the study of cardiac hypertrophy in connection with acute nephritis may elucidate its relation to chronic morbus Brightii.

11. Dr. H. Lindner: Treatment of Recent Empyema in Children (*Jahrbch. f. Kindhilkde.*, XVII. B., 3 H.).—At the present time, the position of the profession, and especially the surgical portion, is quite

in favor of operative proceedings in the treatment of old empyema and empyema in adults. Most authors have, however, opposed this treatment in the case of recent empyema in children, and the author proposes to show that their position is a false one.

His material for observation has been quite large, but he only details one case in full, that of a child only seven months old, in which he very successfully opened the thorax. This, he claims, is the youngest patient on whom the radical operation has been done, but the good result obtained in it is not only not rare, but rather the rule. Yet practitioners constantly urge that puncture is the only safe method to be used. The disadvantages urged against the radical operation are, the greater danger of the proceeding, greater mortality, longer duration of treatment and greater minuteness necessary, while the puncture is described as a perfectly harmless proceeding, easy to perform, and leading rapidly to cure.

The author proceeds to answer these points seriatim. There are no statistics to show, he claims, which of the two procedures is more dangerous. From his own experience and the cases he has been able to collect, he finds that the mortality after the antiseptic performance of the radical operation is extremely small. Authors who claim the contrary have certainly not gained their knowledge from a "modern, antiseptically operating surgeon."

König considers the incision, when antiseptically performed, "a sure and safe operation, rapidly leading to perfect cure." Thoracocentesis, the author claims, on the other hand, is not the simple, safe, and easy procedure which many authors have described it. When carefully carried out with antiseptic precautions, it is indeed a slight thing; but there are few surgeons who cannot show cases in which they have been called upon for the radical operation after the purulent exudation had been degenerated and rendered fetid by a preceding puncture performed by the physician. This degeneration, of course, makes the prognosis less favorable, for, though the lives of such patients can generally be saved, the cure is a much longer one. Two openings are often necessary, and frequent washings.

In regard to the second objection made to the radical incision, that the cure is longer, statistics also fail.

König, from his large experience, computes the average time of cure in an uncomplicated empyema operated on by incision at from three to six weeks.

The author's experience coincides with this, and as no further figures can be found, he considers it fair to accept this as correct. He gives various statistics to show the average duration of cure by puncture, and this he finds to be a little longer than by incision. He omits in this calculation those cases which are rapidly cured by only one aspiration. On account of such cases he formulates the following rule:

"Every recent empyema should be once punctured (aspirated), and, if not cured by this, at once incised under strict antiseptic precautions."

König agrees with him in this, except that he limits it to children not too much debilitated. The author would apply it in all cases.

He then discusses the comparative simplicity of the two treatments; claims that the change of the antiseptic dressing is less trouble than the daily examination of the lungs to see when to puncture again; that after a few days, the dressing may, in older children, be left on six to

eight days, and there is no repetition of the operation. In changing his dressing, he does not use the antiseptic spray, etc., but quickly slides one dressing out from under the other. The amount of exudation is much less in treatment by incision, the tax on the patient's strength much less.

In regard to the entrance of air in the incision, the failure of the lung to expand, the sinking in of the ribs, and the methods of preventing these, the author claims that these dangers are more theoretical than practical, and he takes no particular precautions against them. Another advantage of incision is that the large clumps of fibrin which cling to the pleura, and which, remaining after puncture, may undergo cheesy degeneration, may be removed through the wound.

Discussing the performance of the radical operation or incision, the author does not think it necessary in children to remove a portion of rib. The point of incision is also not a matter of great moment. In small children, it may even be well formed, to prevent soiling from the urine and feces. The children can be frequently turned, so that drainage is free. The double incision is only necessary when the pus is putrid, and frequent washings have to be made. Small children may be held quiet enough without an anesthetic; larger children should be chloroformed. The matter must be allowed to discharge slowly. The opening can be controlled with a sponge or the finger, both carefully disinfected. Contrary to the advice of some, the author uses light rubber bandages in fastening on his dressings. He formerly used the regular, carbolic antiseptic gauze, but now, fearing carbolic intoxication, he uses a gauze prepared with acetate of alumina. This he finds preferable on all accounts.

In closing, he mentions cases in which the pus breaks through into the lungs, and believes that in these we must wait to see what nature will do before we operate; but not delay to cut when fever, difficult respiration, etc., increase to an alarming extent.

12. Stromszky: Traumatic Aneurism in Palm of Hand (*Jahrbch. f. Kindhlkde.*, XVII. B., 3 H.).—DR. A. STROMSZKY reports the case of a seven-year-old boy, of very pale, anemic appearance, who was brought to hospital, with the history that three weeks before he had cut his hand on a broken glass, and that, both at the time and several times since, there had been sharp spurting of blood from the wound, which had occasioned his anemic appearance. Examination showed on the palm of the left hand, just back of the little finger, a circumscribed, round protuberance, soft, as large as a hazel-nut, and covered with a bloody scab. The surrounding skin was normal, but under this swelling a somewhat larger one could be felt. This was not painful; was somewhat diminished on pressure, and pulsated isochronously with the heart. This pulsation ceased when the brachial or the ulnar and radial arteries together were compressed. When one only of the latter was compressed, the pulsation was diminished, but not entirely lost. The scab being accidentally loosened, a fine stream of blood spouted $\frac{3}{4}$ m. high.

Since it was feared that, on account of the arteria interossea, ligature of the radial and ulnar might not stop the flow of blood to the sack, it was decided to extirpate the whole tumor. This was done antiseptically; all vessels, even when close to the bones, tied carefully with catgut; the

wound dressed with Lister's precautions, and in two weeks the boy discharged cured.

13. Satlow: Fatal Poisoning from Chlorate of Potash.—DR. SATLOW reports a case in which the symptoms of poisoning seem to be so clear, that it may be well, in the present interest in this subject, to give rather a full abstract of his article.

O. L., fifteen and one-half years old, was taken, on December 23d, with headache, chills, sore throat—in short, the symptoms of slight diphtheria, which the author diagnosed the same evening, and for which, besides other things, a gargle of chlorate of potash was given. The course of the disease was favorable, but, on the next day, 24th, the patient complained that he could not gargle with the potash, as he always swallowed half of it, and it made him sick. He was told to stop it, and wine was ordered; but, in his eagerness to get well for Christmas, he continued the gargle through the afternoon and all the night almost unceasingly, so that he used the whole solution of 60 gm., of which he must have swallowed about half. In the night of the 24th–25th, the symptoms of intoxication began, with frequent vomitings of blackish-green masses, and passages of thin, dark-green stools. Before midnight, a little blackish urine was voided; then no more. At break of day, icterus was observed. At 9 A.M., the author found the patient greatly changed from the preceding day. Temperature had sunk to 37°; pulse 124, very weak; respiration, 40. The body appeared emaciated in all parts; the face anxious and drawn; conjunctivæ were yellow; skin dry and brittle and dirty-yellow, and at the same time cyanotic, causing a peculiar blue and yellow marbled appearance. Tongue moist, slightly coated; false membrane disappeared from the tonsils; lungs normal; heart-sounds normal; abdomen not distended, but somewhat tender; liver enlarged, and very tender; spleen slightly enlarged, and both painful and tender; bladder absolutely empty, though no urine had been passed since the evening before. Patient complained of weakness, oppression about the heart, and want of breath. The intellect was clear. The vomiting of the green masses continued to occur about every fifteen minutes. Finding then the amount of chlorate of potash which had been taken, the author immediately diagnosed the case as one of poisoning from this drug.

The weakness of the heart being the most threatening symptom, camphor injections were given, with good result. The vomiting, however, continued, in spite of opium, ice, etc. Port wine and fluid food were given, but not retained. This condition continued without change till 4 A.M. of the 26th, when, with intense pain, a few drops of thick, blackish-red urine were passed.

26th, 4 P.M.—General condition a little better, and a little more urine passed.

Heubner, in consultation, confirmed the diagnosis, and ordered hydrochloric acid and chloride of sodium. The urine contained no intact red blood-corpuscles, but consisted of (1) a large amount of intensely reddish-brown bodies of partly round and partly cylindrical shape. These broken bodies or bits consisted of conglomerated brown particles. (2.) Quite a number of well preserved white blood-corpuscles. (3.) A little epithelium, with well-marked nuclei. (4.) Bacteria.

The improvement of the afternoon was of short duration. At midnight, the pulse was 148 and miserably weak, and the other symptoms all threatening. Transfusion was performed, 100 cc. of defibrinated blood being injected. Immediately after this the patient was much better, but at 5 A.M. on the 27th, collapse occurred, from which he was roused by camphor injections.

27th, 9 A.M.—Icterus, cyanosis, pain over the spleen, anuria, no stool, vomiting again. The condition grew gradually worse, with these same general symptoms, until, at 7 P.M., transfusion was again resorted to, 300 cc. of blood being injected. The patient fainted several times during the operation, but after it there was some slight improvement, and a little urine was passed, which resembled what was passed before, and gave the hemoglobin reaction, and did not contain a single intact red blood-corpuscle. From this time on, the patient failed, and, though the intellect remained perfectly clear, he died at 2 A.M. on the 28th.

The pathological appearances after poisoning by chlorate of potash having been lately given in this JOURNAL, I only say that in this case they were well marked in every respect, leaving absolutely no doubt of the diagnosis.

The author reviews the case carefully and at great length, but as the object of our abstract has been to give the symptomatology, we need not follow him closely.

The principal points are:—The prodroma of weakness out of proportion to the existing disease and rapidly increasing anemia; the violent gastric and intestinal catarrh, vomiting of dark-green masses, and stools of the same kind followed by absolute constipation; the influence on the blood, making it dark and thick; the icterus and discoloration of the skin; the *anuria*; the changes in liver and spleen, with the pain in the spleen; the great weakness of the heart, causing hyperemia of the lungs, cyanosis, and dyspnea; and the lack of characteristic temperature.

In regard to treatment, the author believes that early and abundant transfusion offers the best hope of cure, but in order to be of use, it must be *both early and abundant*. In some cases it might be well to bleed before practising the transfusion, but not when the patient is already so weak as in his case.

14. John M. Keating: Heart-clot as a Fatal Complication in the Acute Fevers of Childhood (*Amer. Jour. Med. Sci.*, Jan., 1882).—The author refers to specimens of the thoracic viscera previously exhibited, taken during a severe epidemic of measles at the Philadelphia Hospital, and to the experience of most practitioners, as confirming his view that heart-clot is a frequent cause of death in acute fevers in childhood. Dr. J. L. Smith speaks of thrombosis of the cranial sinuses from clonic convulsion, as in the cough of pertussis, and of sudden deaths in infectious diseases from degeneration of the heart-muscle, or from ante-mortem heart-clot. And Fothergill mentions irritation of the vagus as inducing clot formation by retarding the heart's action.

To enumerate, then, the conditions predisposing to heart-clot in fevers, we have first a weak organ with a tendency to incomplete emptying of its cavities, from rapid and insufficient contraction; secondly, obstruction to free circulation, mostly found in the lungs, from either engorgement or imperfect aëration of the blood; and thirdly, probable irritation at

times of the vagi, especially when subjected to pressure by the bronchial glands or inflammatory products. Further, when the blood coagulability is increased, less obstruction will suffice to produce clots. This process begins so insidiously that the most careful examination may fail to detect it. There is no one pathognomonic symptom of it. Perhaps palpation with the open hand on the precordia is the best test.

A fair impulse usually presents some fluttering or halting when a clot is forming, and there may be an intermittence in its force. Any of these signs, with insufficient radial fulness, should put us on the alert. Cold extremities, unusual pallor, or cerebral anemia are of grave omen, and, when the clot becomes extensive, asphyxia occurs. Left-sided clots are usually found where the heart-muscle has been weakened, and, when the death agony has been prolonged, their color and extent show them to have preceded death by a considerable interval. A more common condition, and one which, if early detected, may sometimes be averted, is found in the right ventricle.

Any of these factors, or their combination, may account for the mortality of these fevers in children. The following are frequent post-mortem appearances: A contracted heart, the left ventricle empty or lined with a thin layer of firm, yellow clot, showing inability to empty itself; the lungs partly healthy, with emphysematous edges, partly inflamed or edematous, and probably a general bronchitis or some broncho-pneumonia—all impeding the current from the right ventricle; this containing a firm clot, at times filling it to the utmost of its diastole, and branching into the auricle and veins.

In diphtheria and scarlatina, the asphyxia caused by the membrane, and the pressure of the enlarged bronchial glands increases the tendency to this formation, while, in measles, the obstruction from the catarrhal condition has the same effect. It must be carefully watched for, as it gives an indication for special treatment.

The early use of an alkali should be associated with the stimulating and supporting treatment. Carbon. ammon. is probably most reliable, but must be used from the commencement, as we have no knowledge that a clot once formed can ever be reabsorbed. The usual recourse to this drug, when everything else has failed, has led us to doubt its efficacy, but, as a *preventive* of heart-clot, it is most valuable. Probably salicylate of sodium will prove of use in early and increasing doses (? J. F.). Beside the endeavor to lessen coagulability, we should try to regulate the heart's action. Digitalis and belladonna are potent agencies. It is probably better to begin with the latter, and withhold the former till later on. Nitrite of amyl might be of use when much systemic venous engorgement exists from cardiac debility, without pulmonary obstruction, by restoring the balance of the circulation and relieving the right heart. It would act more favorably than digitalis, which tends simply to drive a weakened heart without relieving it of its contents (? J. F.), and in the effort causing final exhaustion and a fatal issue.

Stasis from broncho-pneumonia would also contraindicate digitalis, and we should try rather to relieve the pulmonary engorgement by counter-irritation, as friction, warm baths, dry cups, or local steaming.

15. Seifert: Report of the Children's Division of Julius Hospital at Wuerzburg (*Jahrbch. f. Kinderheilkde.*, XVII. B., 4 H.).—DR. OTTO SEIFERT

makes the following report at the request of his "chef," Prof. Dr. Gerhardt, whose name adds importance and interest to any subject in Pediatrics. The report embraces the years 1872-1880. The cases are divided into large classes, and the separate diseases then discussed; while many cases of especial interest are reported in full. The number of cases is not large, but they have evidently been recorded with great minuteness and care.

A. Infectious Diseases.

DISEASE.	MALES.	FEMALES.	TOGETHER.	CURED.	IMPROVED.	UNIMPROVED.	DIED.	AVERAGE AGE.
I. Morbilli.....	18	11	29	26	...	...	3	9 yrs. 9 mos.
II. Rubéola.....	2	...	2	2	...	...	...	4 " 6 "
III. Scarlatina.....	3	16	19	18	...	...	1	4 " 3 "
IV. Varioloid.....	5	3	8	8	...	...	...	6 " "
V. Varicellæ.....	4	1	5	5	...	...	...	2 " 5 "
VI. Typhus abdominalis.....	18	11	29	26	...	...	3	5 " 9 "
VII. Diphtheritis.....	8	12	20	10	...	...	10	4 " "
VIII. Cholera.....	7	9	16	6	...	...	10	7 " 2 "
IX. Meningitis, cerebro-spinal epidemic.	1	1	2	1	...	...	1	13 " "

I. MORBILLI.—We notice the following points of interest. In two cases, the children had had the disease before. In one case, the period of incubation could be positively known, and was fourteen days. In all cases except one, the eruption appeared first on the face, and was fully developed in about twenty-four hours. In only one case was found Gerhardt's "beautiful spotted redness of the epiglottis, the false and true vocal cords, and the upper part of the trachea." Pneumonia and endocarditis each occurred in five cases. In one case, tracheotomy was done for laryngitis. The three cases of death all occurred in one year.

II. RUBEOLA.—The fact that only two cases of rōtheln, or German measles, occurred in these years is explained by and itself shows the mildness of the disease, the children being rarely taken to hospital for it.

III. SCARLATINA.—The disease varied greatly in the different epidemics. In all but one case there was diphtheritic deposit in the throat. Up to 1880 there was nothing of special interest. In that year there was a slight epidemic in the hospital itself, which was only stamped out by vacating some of the rooms; and there was a whole family (mother and five children) brought in with the disease. The *treatment* in all cases was—first, an ice cravat around the neck, and pieces of ice to swallow, chlorate of potash internally (5.0 : 150), liq. ferri sesquichlor. (5 : 1000, with a little spir. vini), as a gargle for the larger children, frequent painting with absolute alcohol, and later with tra. rhatanæ. At the first signs of endocarditis, ice-bags were laid on cardiac region. Acute inflammatory rheumatism was treated by salicylate of soda, and if the doses were large enough, was always rapidly cured.

IV. VARIOLOID.—In 1877, there were seven cases which present some points of interest. One was in a child who had hereditary syphilis, and several of the pustules took on the character of a syphilitic rupia, followed by ulceration, which only yielded to specific treatment. This is in accordance with observations collected and arranged by Dr. Spiegel in a

paper on "The influence of vaccine on latent syphilis." Another child had some time before been successfully vaccinated, was unsuccessfully revaccinated six weeks before the attack, and then, shortly after it, again *successfully* vaccinated. Five had been successfully vaccinated in infancy. The duration of the initial stadium was one to four days. The treatment was by dilute acids, and when the headache was severe, ice-bags to the head.

V. VARICELLÆ.—The only point of interest is that in all cases a slight rise of temperature was noticed at the time of the appearance of the vesicles—contrary to Thomas and others.

VI. TYPHUS ABDOMINALIS.—One interesting case, with well-marked symptoms, was in a child twenty-four days old, whose mother died of the disease a few days after its birth. It never was nursed by the mother, and the question was whether it acquired the disease through the placental circulation or by inhaling the disease germs. Other interesting cases have been reported in detail in articles already published. In the clinical history of all the cases, the following points may be noticed. The disease in seventeen cases began, as usual, with headache, dizziness, loss of appetite, weakness, pain in the limbs, and diarrhea. Five cases began with constipation, complicated in one with anuria. In seven cases, the disease was ushered in by a chill. In five, there was obstinate vomiting. The swelling of the spleen was marked in eleven cases, and slight in eighteen. The roseola was absent in three cases. The urine was albuminous in three. The duration of the fever was seven to forty-six days—average, ten days. Many other points might be gleaned from the report, but these are the principal ones. The treatment consisted of cold packs, cold douches, red wine, good nourishment, etc. Leaving out one case, which was fatal from other causes, the mortality was nine per cent.

VII. DIPHTHERITIS.—Of this, there were twenty cases. The source of infection was not demonstrated in any of them. There were many of them brought in when already in a state of asphyxia, which accounts for the high death-rate. In all but five cases, the diphtheritis involved the larynx. These five ran an easy and favorable course. In one case, the pulse rose to 200, and the great swelling of the neck pointed to paralysis of the vagus. In two cases, there was endocarditis; in four, nephritis. The mortality was fifty per cent. Tracheotomy was performed in eight cases, of which two recovered and six died—twenty-five per cent of recoveries. Gerhardt holds as a rule that tracheotomy should not be performed in children under two years of age. Of the six fatal cases, one died on the day of the operation, three the day after, and two the second day. The day after the operation is considered the most fatal.

The *treatment* in all cases was: ice cravatte around the neck; to older children a gargle, as in scarlatina, and to younger children painting of the throat with the same things. To all was given chlorate of potash. In no case were there any symptoms of poisoning from it. Wine was given freely, and hourly inhalations of lime-water used.

VIII. CHOLERA.—It was concluded that the diarrheas of children were less frequent than those of adults, the rice-water appearance of the stools often absent, and in children under one year always absent. In three cases (fatal), there was aphonia, the "vox cholericæ." The treat-

ment was smaller or larger doses of tr. valerian, laudanum, ext. belladonna, and red wine.

IX. MENINGITIS CEREBRO-SPINALIS EPIDEMICA.—Since 1851 there have been frequent small epidemics of this in Würzburg, but in the small number of cases here reported there are no points of particular interest.

The next general class includes:—

B. Diseases of the Respiratory Organs.

No.	DISEASE.	MALES.	FEMALES.	TOGETHER.	CURED.	IMPROVED.	UNIMPROVED.	DIED.	AVERAGE AGE.
A...	Spasmus glottidis.	1	1	1	1	1	1	1	7 weeks
B...	Papillomata laryngis	1	1	1	1	1	1	1	4½ years.
C...	Paralysis mm. crito-arytæn. postic.	1	1	1	1	1	1	1	4 "
D...	Pertusis.	3	3	6	4	1	1	1	6 "
E...	Bronchitis	7	6	13	8	1	1	4	2¾ "
F...	Pneumonitis	13	15	28	17	1	1	10	5 "
G...	Phthisis pulmonalis	26	17	43	1	7	17	29	6 "
H...	Atelectasis pulmonum	1	1	1	1	1	1	1	1½ "
I...	Sarcoma pulmonum	1	1	1	1	1	1	1	12 "
K...	Pleuritis	7	3	10	5	1	1	4	5½ "
L...	Pneumothorax	1	1	1	1	1	1	1	4 "

A. SPASMUS GLOTTIDIS.—The case was in a child of seven months, who had been poorly and unfittingly fed during the first weeks of life, and was suffering in consequence from a gastro-intestinal catarrh. The attacks were severe, and came on several times a day, but after about a month, they yielded to good food and care. The child died some time after from pneumonia, not in any way connected with the glottis spasm.

B. PAPILLOMA LARYNGIS.—It was found necessary to perform tracheotomy, and, in spite of repeated removals of the growths and treatment of various kinds, including the galvano-cautery, the canula still (three years after) has to be worn. The author goes into a discussion of the effect of the impeded in- and expiration on the pulse curve, but without his sphygmographic diagrams, it is not of interest.

In the cases of PERTUSSIS, the treatment consisted of regular inhalations of a one-half per cent solution of bromide of potash and the administration of small doses of quinine two or three times a day.

There is nothing new in regard to BRONCHITIS.

F. PNEUMONITIS.—In two cases, the disease seemed to be clearly traceable to "taking cold" (Thomas). One child was attacked right after a fall into cold water, and another after long standing in cold water. The cases, taken all together, showed plainly the influence of severe diseases, and diseases which undermine the constitution, in producing a predisposition to pneumonia. There were five cases in nursing infants, showing, as Thomas says, that this age is not free from danger. In regard to the clinical course, there is nothing of note. The most frequent seat of disease was the lower lobe, and on the right side more often than the left. Convalescence was accomplished, on an average, on the fifteenth day. The treatment was by ice applications to head and breast, which the children usually liked. Small doses of quinine and sometimes inhalation of a one-per-cent solution of muriate of quinia. For nourishment, red wine or Tokay, beef-tea, and milk.

G. PHTHISIS PULMONUM.—Of this, there were forty-three cases. The youngest child was three months old. Six cases were in the first year, ten in the second and third years, and the others in the fourth to fifteenth. In twelve cases, there was a clear family history of phthisis, and in all but four, a family history of some debilitating trouble. In noticing the course of the disease, we find that night-sweats occurred in fifteen cases; the fever showed the usual morning remissions and evening exacerbations; hemorrhage rarely occurred; and in only three cases pain was complained of. The seat of disease was in seventeen cases the right apex; in fourteen, the left apex; in eight cases, both apices; in two, especially the middle lobe, and in two, especially the lower lobe.

In discussing the physical signs, the author mentions several cases in which the autopsies confirmed the diagnosis of the shape and position of cavities in relation to the body, as made by the change of tone on auscultation with the patient sitting and lying—a higher tone when lying than when sitting—meaning that the greatest diameter of the cavity is antero-posterior. Gerhardt insists on the *higher pitch* of the tone for this sign.

Enlargement of liver, with fatty degeneration, occurred eight times; caseous deposits in the spleen four times. In twenty cases, there was most obstinate diarrhea, and the autopsies showed extensive tubercular ulcerations in the ileum. In only three cases was there albuminuria. There was one beautiful case of Addison's disease, the suprarenal capsule being found at death to contain caseous deposits.

In regard to treatment. Though hospitals are usually bad places for phthysical patients, yet most of these children came from such poor homes that the cleanliness, fresh air, good beds, and good nourishment of the hospital really was of great benefit.

Salt-water baths (Soolbäder) were given two to three times a week when possible; when not, cold washings seemed to do good. Generous diet, of course, milk in abundance, and where this was not well borne, koumis was given. Children with diarrhea bore koumis better than any other nourishment. The medicinal treatment was as usual: Cod-liver oil, opium, and tannic acid for the diarrhea; atropine, in small doses (0.0003–0.0005), for the night-sweats; syrup. ferri iodid. for swelling of the glands, and quinine for the fever.

I. SARCOMA PULMONUM.—This is the only case of osteo-sarcoma in childhood on record. It was in a twelve-year-old boy, who entered the hospital for osteo-sarcoma of the right knee. Amputation being done, in four weeks there were symptoms of lung trouble. Gerhardt believes the disease must therefore have been carried to the lungs long before the operation. It must have been carried by the lymph-vessels, and, though the autopsy did not determine it precisely, yet it probably began in the bronchial lymphatic glands. Other lymphatic glands were enlarged before the operation. The diagnosis was made during life, strengthened by an explorative puncture, which seemed to enter a tough, hard substance instead of fluid, and confirmed by the autopsy.

K. PLEURITIS.—As usual, the disease was much more frequent in boys than in girls. Aspiration in one case of serous exudation was successful; in one case of purulent exudation ended fatally.

L. PNEUMOTHORAX.—The case of pneumothorax was in a four-year-old boy, son of phthysical parents. He was taken into the surgical ward for

swelling of the knee, and amputation was performed. When transferred to Prof. Gerhardt's division, the symptoms of pneumothorax were already present. The autopsy showed that the cause of the trouble was the rupture of a small cavity. As there were nowhere else any evidences of caseous degeneration, this was probably not phthisical, but an infarction, which had broken down and ruptured through the pulmonary pleura.

16. Albrecht: The Inhalation of Oxygen for Anemia and Debility (*Jahrbch. f. Kindhlkde.*, XVIII. B., 1 H.).—Since the discovery of this gas by Priestley, many attempts have been made to introduce it in therapeutics. Priestley himself, having experimented with it, remarks: "Who can deny that this gas may become a much sought-for article of luxury, though, as yet, only two mice and myself have had the privilege of inhaling it." About 1790, Beddoes founded a pneumatic institute where, with the assistance of James Watt, who managed the apparatus, he treated patients with the inhalations of oxygen. The new method of treatment spread into France and Germany, but, after a few trials, the difficulty of procuring the gas and its high price led to its disuse. After more than half a century, Demarquay and Leconte (1864) reported to the Académie des Sciences experiments in which animals were kept from fifteen to eighteen hours in pure oxygen, with only favorable effect. The same authors have shown that man can breathe from twenty to thirty litres of oxygen without the slightest disturbance. A sick man on the contrary, feels better for it, breathes easier, and has more appetite. It is contraindicated by tendency to hemorrhage or severe cardiac trouble. Claude Bernard has shown that the blood of animals absorbs more oxygen during fasting than during digestion. Inhalations should, therefore, be given in the forenoon. Following these experiments, the French physicians have used oxygen in a great number of diseases. Hayem deserves the credit of showing its benefit in cases of anemia and chlorosis. In 1879, he wrote: "In chlorotic children with an excretion of from fifteen to but ten grams of urea a day, by the inhalation of only ten litres of oxygen daily, the amount of urea increased to thirty-five and forty grams. The patients gained such an appetite that the usual rations were not sufficient. The general condition improved and the weight increased. The microscope showed that, though the number of blood-corpuscles was increased, the formation of pathological blood-corpuscles still continued, but, when iron was administered, this also ceased. Iron preparations which, before the use of the oxygen, had no influence or were not well borne, now had their full effect." Like results have been published by others.

It is important, first of all, that the oxygen should be pure. In former times, salivation sometimes occurred from the mercury from which the gas was prepared. Apothecary Limousin (Paris) now furnishes an apparatus by which it is prepared in a way which is free from danger, rapid, and cheap. It is made by heat from chlorate of potash and binoxide of manganese, washed in a dilute solution of potash, and stored in a rubber receiver. It should not cloud a solution of nitrate of silver or redden litmus tincture. Limousin's whole apparatus costs only 130 francs. In past times, all sorts of apparatus have been used for the inhalations. Limousin's arrangement is the simplest and best. It is simply a narghile connected with the rubber reservoir. He usually fills the bottle with aro-

matic fluid, consisting of tinct. benzoin, bals. Tolu, and rose water, but simple water or any disinfecting solution is just as good. The lungs should be well filled, the gas retained as long as possible, and exhaled by the nostrils. Age, sex, and disease determine the amount to be taken at one sitting—ten to thirty litres.

During and after each sitting the following points may be noticed.

1. Inspiration becomes deeper and more frequent.
2. The pulse becomes more frequent except when rapid from nervous causes.
3. The temperature rises 1° .
4. In weak children, over thirty litres causes a sort of drunkenness, which quickly passes off.
5. After a few sittings, the appetite increases, and the patient feels lighter and better after eating.
6. The weight increases.
7. The appearance of the patient improves.
8. The action of the bowels becomes regular.
9. The microscope shows increase of red blood-corpuscles in proportion to the absorbed oxygen.
10. Without exception the proportion of hemoglobin in the corpuscles is increased.

During the last year the author has treated fifty patients, mostly children, and from the results obtained formulates these statements.

17. Monti: Biedert's "Rahmconserven" (*Arch. f. Kinderhikunde*, II. B., 2 H.).—DR. MONTI, in an article on artificial nourishment of infants, gives his experience with Biedert's "Rahmconserven," or cream preparation. This consists of one part of kali-albuminate, two and one-half parts butter, four parts sugar, and 0.2 part salts. When diluted with sixteen parts water, this preparation gives a milk which contains 1% albumen, 2.5% fat, 4% sugar, and of salts, $\text{PO}_5\text{N}_2\text{O}$, ClNa , ClKa , PO_4CaO , PO_5TeO , CO_2MgO . Each box contains material for three litres (about six quarts) of milk.

The dilution of 1:16 reacts alkaline, has a spec. grav. of 1020–1025, and contains from 1.959–2.859% of fat. By the addition of cow's milk to a mixture of one tablespoonful of the conserve with sixteen tablespoonfuls of water, the spec. grav. gradually rises and the fat percentage increases, Monti adds all the way from one to sixteen tablespoonfuls of milk, as he finds the mixture well borne.

He has used the preparation:

First, as exclusive food for five new-born children of whom two did not bear it well, but the other three did much better than is usual in such cases.

Second, in six sucklings who had at first had other nourishment, but had become very emaciated from dyspepsia, gastric catarrh, etc. The children varied in age from ten days to three months. In all these cases the dyspepsia and "severe intestinal disturbances" were cured in from six to seventeen days. When the same food was continued on for six weeks to eight months it was found that relapses occurred, but in general the nutrition rapidly improved, and in some cases there was exceedingly satisfactory increase in weight.

Third, in fifteen cases of severe intestinal disease, as a dietetic remedy, with most excellent results.

Fourth, in three breast children who were not being well nourished on account of fault either of quantity or quality of the milk. It proved an excellent addition to the milk in these cases, though occasionally causing dyspepsia.

Fifth, with excellent results in four children who, when first weaned, could not bear cow's milk.

THE AMERICAN
JOURNAL OF OBSTETRICS
AND
DISEASES OF WOMEN AND CHILDREN.

VOL. XV.] JULY, 1882. [No. 3.

ORIGINAL COMMUNICATIONS.

TWENTY CASES OF OVARIAN CYSTS TREATED BY ELEC-
TROLYSIS.

BY
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My principal object in this paper is to give facts, and let them plead for themselves; but I fear I shall not be able to abstain altogether from a few theoretical hints. I shall also have to draw some general conclusions and to make a few critical remarks. So far, and for a long time with impunity, everybody has criticised me. It is not fair play that one side only should speak and the other party alone receive the blows. *Audiatur et altera pars!* Now to the facts.

CASE I.—Gregoria A., forty-two years, twice married, from Amanaleo, State of Mexico, never pregnant; bad color and complexion, thin, skin dry, never sweats.

Dull percussion sound over the abdomen, reaching up to the navel in the middle line, in the right side of the stomach a little higher up; tumor movable, soft, thin walls, liquid contents; fluctuation very distinct, delicate to the touch in its highest point.

Womb low down since many years, in consequence of some effort; movable, adhering to the tumor; monthly courses painful at the beginning, lasting three days, abundant, stopped two

months ago; leucorrhea; sometimes difficult micturition; appetite and digestion good; bowels regular; some flatulence; some dyspnea.

For four years unpleasant feeling in the lower abdomen; hemorrhage (one and one-half months); bearing-down, difficult micturition; pain in the back and thighs; sick headache; neuralgic pains in left leg. All these symptoms increase during the time of menstrual flow.

The patient's husband, a physician himself, discovered a tumor in 1875, size of a large orange, which grew slowly; the size of the abdomen increased considerably; the patient felt strong and strange movements; thought herself pregnant; two slight touches of peritonitis; a third one in April, 1878. Patient had to stay in bed for one month; tumor had grown larger; on the sixth or eighth day of this last paroxysm the tumor broke and discharged its contents through the bowels, one pint of gelatinous matter, yellowish at first, then reddish, and, finally, four to five table-spoonfuls of a thick substance, like melted tallow. Since then the discharge stopped, and the tumor remained for some time in the present condition.

Saw Dr. Martinez del Rio, who sent her to my office. Treatment began at once, June, 1878. Two needles, six elements, ten minutes.

The same on June 14th, 15th, 17th, 18th, 19th, 21st, 23d, 25th.

July 2d and 5th.—Some sensibility in the abdomen; feverish towards evening. After the last application in the horizontal position, tympanitic sound over the highest part of tumor (development of gases in the cyst). Rest until July 10th. Same condition. Two sponge electrodes, one on each side of the tumor, constant current of six elements, ten minutes; tumor seems a little smaller. Tympanitic sound as above; when the patient takes the sitting posture, the place where there was formerly tympanitic resonance now sounds dull; the part of the cyst which is now the highest gives a tympanitic sound, but shorter and higher than that of the bowels.

Up to the last of July, ten percutaneous applications, with two sponge electrodes, and then sittings with one pole (+) inserted into the tumor by means of a needle, and the other pole (—) applied to the skin (metallic electrode and blotting-paper).

The tumor is now of the size of a man's fist, in the right half of the abdomen, between navel and ant. sup. spinous process of ilium; left half of abdomen sounds tympanitic all over.

August.—One needle inserted (+); the negative pole on the skin, as above, on 2d, 3d, 5th, 6th, 7th, 8th, 9th, 10th, 12th, 13th, 19th, 21st, 25th, 27th.

September.—The same 13th, 14th, 17th, 18th, 19th, 20th, 21st, 23d, 25th, 26th, 28th, 30th.

October 1st, 2d, 3d, 4th, 5th, 6th, 7th, 8th, 10th.—Sixty-five sittings.

Tumor of the size of a hen's egg, quite hard. Patient dismissed. Never heard that she had a return. Dermoid cyst.

CASE II.—Manuela H., Mexico, thirty-six years, single; menstrual flow appeared at the age of fifteen years, regular until a few years ago; since then scarce and painful. Two years ago, she began to notice enlargement of the abdomen, pains in the waist and extremity of vertebral column; bowels confined; urine free. After a great deal of treatment for chlorosis and metritis, went to see Dr. Martinez del Rio, who recognized a tumor, and sent her to my office.

Dull sound in the median line of abdomen, beginning two inches above the symphysis, reaches two inches above the navel, extends to one and one-half inches from the left ant. sup. spinous process and three inches from the right ant. sup. spinous process of ilium; tumor soft, fluctuating, walls thin, contents thin; abundantly developed adipose layer over abdomen; womb high up, normal size, adheres to the tumor; external genital organs in virginal condition. Index finger introduced into vagina feels no fluctuation.

Treatment began September, 1878; positive pole introduced into tumor, with one needle, in October, with two needles, and once with three; negative pole on the skin; six elements, and on October 12th, the very limited mobility of the needle and the circumstance that I was never able to bring two needles together within the tumor confirm the diagnosis of polycyst.

Sittings from September 11th to January 14th, altogether ninety-two. Treatment suspended because tumor was so much reduced that it seemed useless to continue. Never heard from the patient again.

CASE III.—Petra P., forty-eight years, married, no children; sick since 1856 with cough, dyspnea, worse every cold season. Saw her for the first time in February, 1879; found pulmonary emphysema in a high degree, ascites, and anasarca. Repeated and careful examination revealed the existence of an ovarian cyst, besides the ascites. Different remedies applied, diuretics, purges, expectorants. Three applications of electricity to the tumor; ascites and anasarca disappeared; my diagnosis of ovarian cyst confirmed by Dr. Martinez del Rio. Patient refused to have electricity continued. Did not see her again until September, when she suffered greatly from difficult breathing. I found the tumor considerably increased, reached nearly to the ensiform cartilage; no ascites nor anasarca. The urgent condition of the case obliged me to tap; we found a polycyst; two cysts were emptied; twelve pints of fluid evacuated, dark brownish-green, highly albuminous, coagulating promptly under the influence of the galvanic current. Saw her again next day, comparatively easy; two days afterwards I found her dying. Post-mortem not permitted.

Was submitted to electrolysis at her home, as she was not able to walk out. Polycyst.

CASE IV.—Feliciano E., thirty-four years, single, poor health, thin, bad color, weak, frequent sweats, vesicular eruption all over

the body, itching; first menstruation at twelve years, regular every month, without pain, abundant up to date; heaviness in lower abdominal region; no discharge; urinated frequently, small quantity every time with a burning sensation; some dyspnea in the dorsal attitude; frequently hysterical convulsions.

Over two years ago, she noticed enlargement of the abdomen, sometimes acute pain in the left groin and colic; occasional pain and swelling of the legs; difficult micturition; stools confined, more so as the tumor gradually grew; flatulence; one and one-half years ago, peritonitic symptoms, nausea, etc. Saw a physician who detected a tumor. Motion felt and seen in the abdomen: no vaginal discharge. On the 15th of August, 1878, tapped; twenty pints of a greenish liquid evacuated. Tumor refilled quickly and had almost reached its former size within two months; the edematous swelling of the legs and feet had disappeared after the tapping, and never returned. She then saw Dr. Martinez del Rio, who sent her to my office.

Fluctuating tumor that grew from below upwards in the left side of abdomen; extends now four inches above navel, to the ant. sup. spinous process, in the hypochondrium to the axillary line and to the ribs; in the right half of abdomen there is tympanitic resonance to the width of one inch between tumor and ant. sup. spinous process, as well as between tumor and liver; in the left side, halfway between navel and ribs, a hard, round body is felt, apparently of the size of a hen's egg, which body is easily depressed in the liquid contents of the tumor. The patient says that after the tapping that hard body was felt in the same place where it is now, and did not come lower down.

Fluctuation very distinct; walls of the tumor thin; its surface even; tumor movable; abdominal walls very thin; the wave is very distinctly transmitted through the tumor in every direction. No tenderness but in the highest part of the left half of the tumor. Pulsation of the aorta very clearly seen and felt all over the tumor. The recti muscles form two longitudinal furrows on the surface. Circumference one inch below navel 85 cm. Internal examination not permitted.

Treatment began on October 28th, 1878; two needles, twelve elements, 29th, 30th, 31st.

November 4th, 6th, 7th, 8th, 11th, 12th, 14th, 15th, 18th.—Circumference in the same line as above 82 cm. 19th, 21st, 22d, 25th, 26th, 28th, 29th.—78 cm. one inch above the navel, where the tumor now was largest.

December 2d, 3d, 4th, 5th, 6th, 9th.—73 cm.; the hard body has gone down to the navel. 10th, 11th, 13th, 16th, 17th, 18th, 19th, 20th, 21st, 23d.—71 cm. 30th, 31st.

1879, January 2d, 3d, 4th, 7th, 8th, 9th, 11th, 13th, 14th, 15th, 16th, 20th, 21st, 22d, 23d, 24th, 27th, 28th.

February 3d.—During the last fortnight the tumor had enlarged again, and from a little below had grown up to one and one-half inches above the navel. The two poles applied with large sponge

electrodes. The same on February 4th, 5th, 6th, 10th, 11th, 12th, 13th, 14th, 17th, 19th, 20th, 24th, 25th, 26th, 27th, 28th.

March 3d, 4th, 5th, 6th, 7th, 10th, 11th, 12th, 13th, 14th, 17th, 18th, 20th, 21st, 24th, 26th. Pain over the tumor. Six days rest in bed: cold applications over tumor: no electricity.

April 28th.—Circumference 84 cm.; tumor harder than before, and almost as large as at the beginning of cure. Two sponge electrodes: great tenderness; pain all over the abdomen for two hours. The same application on 29th, 30th, and

May 6th, 7th, 8th, 9th.—Great tenderness; no diminution of tumor. Treatment suspended. Tumor continued growing slowly.

On June 20th, it was a little larger than at the beginning of the cure. Tapping: sixteen pints evacuated; liquid thin, brownish-green. The cyst seemed to be completely emptied. Two days later symptoms of circumscribed peritonitis at the point of tapping: tumor had refilled up to navel. Under appropriate treatment, the symptoms of peritonitis subsided.

On July 14th, the patient came again to the office; the cyst reached two inches above the navel: in the upper left part the hard body was distinctly felt. Two sponge electrodes, one on the tumor, the other on the back, in the sitting posture of the patient: twelve elements, twelve minutes. The same on July 18th, 21st, 23d, 25th, 30th. Cyst continues growing; treatment suspended.

A couple of months later, I heard the patient had undergone ovariectomy, and had died on the third day after the operation. It was impossible to obtain any particulars. Monocyst.

CASE V.—Victoriana G., thirty years, married at fourteen years; five children; the last one seven years old; menses regular; poor general health, pale and thin. During the last five years she noticed increasing enlargement of the abdomen; no inconvenience, except the annoyance of the increased stomach. Thin, flabby abdominal walls; soft, distinctly fluctuating tumor in the lower abdomen, almost in the medial line, up to the navel. Patient thinks the tumor grew from below and from the right side.

1879, February 9th.—Tapping; thirteen pints evacuated of a clear, thin liquid; shows neutral reaction; albumen coagulates freely on addition of nitric acid and under ebullition. The electric current produces no coagulation, only a flaky cloud on the negative pole, mostly due to a development of gases, which cloud dissolves again in a few hours. The tumor seems to have been perfectly emptied.

February 12th.—Tumor of the size of a big orange, extending to within one inch from the navel; two needles; six elements; ten minutes; the same on 17th, 19th, 24th, 25th.

March 10th.—No tumor to be found: the patient had been sent to me by Dr. Martinez del Rio. Parovarian.

CASE VI.—Jesus T., forty years, married, laundress, twelve confinements, good and bad; abdominal tumor these last five

years, discovered during last confinement. Micturition, defecation, menses normal; general condition poor.

1879, March 25th, Dr. Martinez del Rio sent her to my office. Large, fluctuating tumor, fully developed to the third stage (Peaslee), movable, tending to the left side of patient. Womb normal, movable; in the left cul-de-sac fluctuation felt; surface of tumor smooth; circumference at the height of the navel 94 cm. A needle introduced enters 16 cm. without difficulty, and moves freely in a large cavity.

March 31st.—First sitting. One needle, six elements, twelve minutes. Positive pole on the surface. On withdrawing the needle there appear a few drops of a yellowish, cloudy liquid.

April 2d.—On account of the enormous size of the tumor, we tapped, to relieve the patient and gain time, hoping to deal more easily with a smaller quantity. Four pints withdrawn; tympanitic sound between symphysis and tumor; 9th, 10th, 12th, fever; no pain in abdomen.

15th.—Pulse 92, temperature, $39.1^{\circ}\text{C}.$; circumference 87 cm.

24th.—Fever continues high; patient sinks; circumference 89 cm. We felt convinced we had to do with suppurative peritonitis, starting by the tapping, and resolved to resort to ovariectomy as a last refuge.

May 1st.—Ovariectomy; cyst adhering to anterior abdominal wall at the place of tapping. Suppuration and development of foul gases in the cyst; general suppurative peritonitis; numberless adhesions easily divided by the finger; ulceration and perforation of cyst-wall; great quantity of thick, fatty, tallow-like substance at the bottom of cyst; abundant capillary hemorrhage, controlled with great difficulty; no pedicle found. Died two hours after the operation, with symptoms of collapse. Dermoid cyst.

CASE VII.—Casimira B., seventy-six years, widow. Cannot remember any serious illness during her life. Five children. Menstrual flow ceased since 1867, after four years of almost continuous hemorrhage. Soft, fluctuating, smooth tumor in the abdomen extends to both anterior superior spinous processes and within one finger's width from the liver and ribs (on the left side). Wave, on tapping on the cyst, propagates very distinctly through the whole liquid content of the cyst and in every direction. Womb high up in the pelvis; no fluctuation felt through the vagina. The tumor shows very distinctly the pulsation of the aorta. Largest circumference 91 cm. Patient noticed the tumor these last six years, and remarked that it grew from below upwards. April 17th, first sitting. One needle (—) inserted, the other (+) electrode on the surface of abdomen; the same on 18th, 19th, 21st (85 cm.); 22d (considerably increased excretion of urine during the last few days); 24th, 25th, 26th, 28th (80 cm.); 29th, 30th, May 1st, 2d, 3d, 5th (77 cm.). On the 6th, 8th, 9th, 12th, 13th, for the sake of experiment, the applications were made in the sitting posture of the patient, one rheophore between navel and

symphysis pubis, on the skin; the other on the back. Dull sound can now only be perceived in the sitting posture of the woman, and extends upwards within two fingers below the navel. In the recumbent posture, the tumor sinks back towards the sacrum, and intestines spread out between the tumor and the anterior wall of abdomen (76 cm.).

14th, two needles, connected with negative pole, inserted in the tumor, positive pole with sponge on the back, in the sitting posture; the same on 15th, 16th, 17th, 19th, 20th, 21st, 23d, 26th, 27th, 28th, 29th, 30th.

June 3d, 4th, 5th, 6th, 7th, 9th, 10th, 11th, 13th, 14th, 16th, 17th, 18th, 19th, 20th, 21st, 23d, circumference one inch below navel 75 cm. No tumor to be felt. Monoyst.

CASE VIII.—Carmen G., widow, forty years old, two children, last one five years ago. Menses always regular, abundant, sometimes anticipating. One year ago, she went to a hospital for some eye complaint, and there a tumor was discovered in her abdomen; tense, fluctuating, distinct wave, sensation of hard body in the depth. Size half third stage (Peaslee). Womb high, not to be reached with the index-finger, fluctuation in either cul-de-sac. Rest bad, bowels costive, micturition easy but frequent, heavy of hearing since a child. Pannus corneæ and syndesmitis these last thirteen years. Poor general health; epileptic fits.

April 24th, 1879, first sitting, two needles inserted, show very little mobility, cannot be brought in contact, as they seem to stick fast in a resistant body. Largest circumference 86 cm.; 26th, 28th, 29th, 30th, May 2d, 3d, 6th, 7th (79 cm.); 8th, 9th, 10th (86 cm.); 13th, tumor has increased again and is tender; 15th, percutaneous application of both poles; idem 19th (81 cm.), 21st, 23d, 26th, 28th, 30th.

June 2d, circumference 85 cm.; in the longitudinal diameter, the tumor only runs up to the navel, while before it reached midway between navel and ensiform cartilage. Did not return to my office. Cysto-fibroma.

CASE IX.—Juana S., forty years old, single, menses always regular; stopped ten years ago; since then she is aware of her disease, but her abdomen was enormously large many years ago. She never suffered from her tumor. Many varicose veins in the skin of her abdomen. Dull sound over abdomen up to the ribs on the left side; on the right side, there is tympanitic resonance in a space two fingers wide between tumor and ribs, then comes the liver, pushed upwards. On the right side below the navel there is a hard place, no fluctuation, and great resistance in thrusting a needle in; surface of tumor pretty smooth, circumference 108 cm.; genital organs in virginal state.

1879, June 17th, one needle (—) inserted, idem 19th, 21st, pain 23d. Both electrodes applied to the surface with sponges; the same on 24th, 25th, 28th, 30th.

July 3d, 5th, 7th, 9th, 11th (tumor in the left side is now four fingers distant from the ribs, and extends in the median line 15 cm.

above navel. Circumference 105 cm.); 14th, 16th, 19th (dulness extends 13 cm. above navel); 21st, 23d, 25th, 29th, 31st.

August 2d, 5th, 7th, 12th (105 cm.). Patient became tired, and did not return; but she had no accident or inconvenience. Cysto-fibroma.

CASE X.—Micaela O., thirty-seven years, single, first menstruation at twelve years, always irregular, sometimes nothing for more than a year, then returned again; years ago so-called inflammation, pains in the back, whites. These last two years she notices enlargement of the stomach, fluctuating tumor in lower left part of abdomen, up to the umbilicus, and extending to the right one and one-half inches beyond the median line, dull sound only when percussion made with a certain force and pressure; fluctuation in the anterior cul-de-sac; largest circumference 89 cm.; strongly built, stout woman. Sent by Dr. Martinez del Rio.

1879, October 29th, first sitting; positive needle inserted, eight elements, ten minutes; same on 30th, 31st.

November 4th, 5th, 7th, 8th, 17th, 18th, 19th, 20th, 21st, 22d, 24th, 25th, 26th, 27th, 28th, 29th.

December 1st, 2d, 3d, 4th, 13th, 15th, 16th, 17th, 18th, 19th, 20th, 22d, 23d, 24th, 27th, 29th.

1880, January 7th, 8th, 9th, 10th; thirty-nine sittings; cured and dismissed.

October 20th, a cystic tumor in the same place as before, two-thirds the size of the former. New cyst or relapse? One needle with + pole, ten minutes, eight elements; the same on 21st, 22d, 23d, 24th, 25th, 26th, 27th, 29th, 30th. No tumor.

CASE XI.—Eugenia P., thirty-eight years, married, six children, no accidents in confinements, miscarriage nine months ago. Four months ago she noticed enlargement of her abdomen, fluctuating tumor up to the navel, more developed in the left side of abdomen, fluctuation and wave very distinct. Womb high up, inclined to the right; in the anterior cul-de-sac, left side, distinct fluctuation felt. Largest circumference 76 cm.; troubles in defecation and micturition; no pains. Ovariectomy had been proposed to her. Sent by Dr. Martinez del Rio.

1880, January 26th, positive needle inserted, six elements, ten minutes. The needle moves very freely in the tumor, and its point describes a large circle without any difficulty; 27th, 28th, 29th, 30th, 31st.

February 3d, 4th, 6th, 7th, 9th, 10th, 11th, 12th, 13th, 14th, 23d, 24th, 25th, 26th. Two needles; 30 small Calland elements; the same on 27th, 28th.

March 1st, 2d, 3d, 4th, 5th, 8th, 9th (76 cm.), 10th, 11th, 12th, 13th, 23d, 24th, 29th, two electrodes with sponges; the same 30th, 31st (72 cm.).

April 1st, 2d, two needles inserted, same battery; 3d, 5th, 6th, two sponge electrodes; the same on 8th, 9th, 12th, 13th, 16th, 17th, 26th, 27th, 29th, 30th.

May 1st, 3d, 10th, 11th, 12th, 13th, 14th, 15th, 18th, 19th,

24th, old battery; 6th, large Calland; positive needle inserted 25th, 31st.

June 7th, patient says she feels comfortable, and does not return. I have since met her many times in the street.

CASE XII.—Cirila G., thirty-five years old, ten years married, no children; first menses at fifteen years; since then regular; abdomen enlarging these last five years. Dulness in lower half of left side of abdomen, up to the level of the navel, and a little beyond median line to the right side; fluctuation indistinct, dull, and deep; distinctly perceived in the posterior cul-de-sac on the left side. Was sent to my office by Dr. Martinez del Rio.

1880, April 21st, first sitting. One needle, positive pole; I gradually augmented the electric power, and when I reached twelve elements the patient began to vomit, broke out in an abundant perspiration, and felt completely knocked down. Sent her home; since then, six sittings in two weeks; percutaneous; one pole on abdomen, the other on back.

July 21st, 23d, 26th, 29th, 31st: the same

August 2d, 4th, 6th, 16th, 18th, 20th, 23d, 25th, 27th, 30th, one needle inserted with positive pole; negative pole with blank zinc; both on abdomen. The same

September 1st, 3d, 17th, 18th, 20th, 21st, 22d, 23d, 24th, 25th, 27th, 28th, 29th, 30th.

October 4th, 5th, 6th, 7th, 8th, 9th, 11th, 12th, 13th, 15th, 16th, hardly any tumor noticeable.

November 8th, 10th, 13th, six elements.

December 1st, 6th, 8th, 11th, 14th, 16th, 18th, 21st.

1881, January 17th, no tumor.

Saw the patient many times since; she is perfectly well.

CASE XIII.—Mary M., fourteen and a quarter years, of English parents, born in this country; first menstruation at twelve and a half years, then two or three times more at regular intervals, and then no more. Consulted on that account, and because her abdomen grew larger. I found a fluctuating and undulating dull tumor, filling the whole left side of the abdomen to the left anterior superior spinous process, upwards to one and one-half inches above navel; in the right side halfway between navel and anterior superior spinous process; genital organs virginal; in the anterior cul-de-sac fluctuation, when the other hand taps on the tumor. Largest circumference 84 cm.

1880, September 21st, first sitting; positive pole, armed with needle, inserted; negative pole on the skin of the stomach, with blank metal ball and salt-water; eight great Callands; same on 22d, 23d, 24th, 25th, 27th, 28th, 29th, 30th.

October 1st, 2d, 4th (circumference 82 cm.), 5th, 6th, 7th, 8th, 9th, 11th, 12th, 13th, 14th, 15th, 16th, 18th, 19th, 20th, 21st, 22d, 23d.

November 3d (80 cm.), 13th, 17th, 20th, 22d, 24th, 27th, period returned. No tumor.

CASE XIV.—Luz M., widow, thirty-eight years, two children; last confinement twelve years ago; since then no menses, but molimina. Consulted for that reason, and examining her abdomen found a dull, fluctuating tumor in the left lower part, comprising the space between navel, left anterior superior spinous process, and linea alba. In the upright attitude, the tumor protrudes. Distinct wave felt in the anterior cul-de-sac, left side, when tapping on the tumor at its highest point. Tumor is said to have developed from below upwards.

1880, November 17th, first sitting; 20th, 22d, 24th, 27th, 29th. December 9th, 11th, 15th, 20th, 22d, 29th.

1881, January 12th, 19th, tumor reduced to the size of man's fist above the inner third of Poupart's ligament.

February 2d, tumor quite hard, a little smaller; it was not considered necessary to insist any longer on electricity. Continues well.

CASE XV.—Victoria V. de Blanco, twenty-three years; first menstruation at thirteen years, married five years, miscarriage four years ago; since then, pains in the left lower half of abdomen; worse at time of the menstrual flow, which turned irregular, sometimes very scarce, sometimes very abundant during eight days.

In the lower part of the left side of abdomen, dull sound and not very distinct fluctuation; sensation of the wave very well marked. Dull sound up to the navel, halfway between that and left anterior superior spinous process; on the right side one and one-half inches beyond median line. When the bladder is empty, there is tympanitic sound above the symphysis pubis and above the middle of the left Poupart's ligament, to the extent of one and one-half inches; in the anterior cul-de-sac very distinct fluctuation.

1880, November 20th, first sitting; one needle with positive pole, six elements, ten minutes; 22d, 24th, 27th, 29th, painful bearing-down sensation; December 6th, 13th, 15th, 18th, 20th, 23d, 27th, 29th. 1881, January 10th. March 9th, 10th, 11th, 12th, 14th, 21st, 23d, 4th, 26th, 30th.

April 4th, 5th, 8th, 9th, 11th, 12th, 13th. The interruption from January 10th to March 9th was not due to any accident, but to family circumstances and laziness, which were likewise the cause why the treatment was finally discontinued. The general condition of the patient up to date is flourishing.

CASE XVI.—Teresa E., fifty-five years, married, two children; does not remember when she had the first menses; afterwards continued normal. Several years ago, she noticed something wrong in her abdomen.

Fluctuating tumor, thin walls, smooth, even surface in the abdomen, tending a little more to the right side than to the left; two fingers above navel, and as much from right anterior superior spinous process; distance from tumor to left anterior superior

spinous process the width of a hand. Largest circumference at the navel 90 cm.

1881, February 25th, first sitting; one needle, positive pole.

March 1st, 2d, 3d, 4th, 5th, 7th, 8th, 9th, 10th, 12th (83 cm.), 14th, 15th, 16th, 17th, 18th, 21st, 22d, 23d, 28th, 30th, 31st (82 cm.).

April 2d, 5th; cured. Tumor reduced to a hard lump size of an apple.

CASE XVII.—*Jacoba T.*, twenty-nine years, married, ten children, last one two years old; menstruation always regular, when not in the family-way, which is her normal condition. Two years ago she noticed enlargement of the abdomen. Fluctuating tumor occupies the whole lower half, extending three and one-half inches above navel and to both anterior superior spinous processes; abdominal walls thin and flabby; cyst-wall thin, smooth, contents quite thin, like water. In the dorsal posture, the tumor and abdomen flatten very much, and then quite a thin layer of liquid on the highest point of abdomen gives on percussion a half-tympanitic sound. These last few months prolapsus uteri, due to a strain. In the horizontal attitude, the os uteri appears at the vulva; fluctuation after reposition of the womb in anterior and posterior cul-de-sac. Largest circumference at the navel 93 cm. Dr. Martinez del Rio sent her to my office.

1881, March 2d, first sitting. The needle passed in freely, and was moved round in a large circle; two needles, introduced at very distant spots of the tumor, are easily brought together inside. When removing the needle, a few drops of light-greenish liquid oozed out from the puncture. 3d, 4th, 6th, 7th; all these days she discharged a considerably increased quantity of urine. 8th, 9th, 10, 11th, 12th, 14th, 21st, 24th, 26th, 28th, 29th, 30th.

April 7th, 8th, 9th. The woman stopped calling at the office from indifference; I positively know that she had no unpleasant accident.

CASE XVIII.—*Angela G.*, twenty-one years, married two years; first menstruation at twelve and a half years; since then, irregular; general health splendid. Consulted me on account of sterility and of a sharp, corroding vaginal discharge. Erosions of the cervix, cervical catarrh, benign colpitis, all of which gave way under appropriate treatment. Examining her abdomen, I found a thick layer of fatty tissue, and in the depth a round, hard smooth body in the lower part of her abdomen, on the left side, about the size of the head of a new-born child. Percussion gave a dull sound in a limited extent; on account of small size of tumor, thick abdominal walls and habitual flatulence, fluctuation not distinct; yet I was convinced that the tumor was not solid. Womb high up, moves independently of tumor, no fluctuation detected through vagina. When I told the lady what I had found, she felt almost happy, because she said she had for a long time herself felt that body with her hand, and, when she turned

in bed from the left to the right side, she felt, a long time ago, as if something heavy were rolling over in her abdomen.

1881, April 21st, first sitting. After eleven sittings the tumor had disappeared. When the needle was introduced, its point could not be moved about much, because of the small size of the cavity, yet I was able to feel that, after a certain effort needed to get through the abdominal and cyst wall, the needle entered a cavity. I have had opportunities to meet this lady several times since and am satisfied she is well. The baby has not yet arrived.

CASE XIX.—Dolores S., twenty-three years, single, consulted me for irregular and painful menstruation.

Dull percussion and fluctuation in the inferior left side of abdomen up to the navel, halfway between navel and right sup. ant. spinous process, to the left filling the whole space down to the ant. sup. spin. process. Tympanitic sound two fingers wide between symphysis and tumor: fluctuation dull: panniculus adiposus very much developed; genital organs virginal, womb high; in the posterior cul-de-sac, left side, indistinct fluctuation. Measurement between the two ant. sup. spinous processes twenty-seven centimetres.

1881, November 7th. First sitting, one needle with positive pole, six elements, ten minutes, the same 8th, 9th, 10th, 11th, 12th, 14th, 15th, 17th, 19th, 23d.

December 6th, no tumor.

CASE XX.—Maria M., forty-three years, menstruation suspended many years ago, molimina, cerebral congestion. Dull, round tumor in left lower half of abdomen, up to navel and left ant. sup. spinous process as well as halfway between navel and right ant. sup. spinous process; fluctuation dull, through the vagina not at all to be felt on account of high situation of womb; genitals virginal: distance between the two ant. sup. spinous processes forty-three centimetres.

1881, November 11th. Two needles, which met in the interior of the tumor. 12th, one needle and one sponge electrode, six elements, ten minutes; 14th, 15th, 17th, 19th, 29th, 30th, the same.

December 1st, 2d. Tumor almost disappeared; induction current, two sponge electrodes, the same on 6th, 10th, 13th, 14th, 16th, 17th, 19th, 21st. Cured.

The faradic current was applied because the patient complained of very much burning with the needles, on account of the extremely thick fatty layer over her abdomen.

After an attentive perusal of these cases, various questions arise and require to be considered.

1. *Were these tumors really ovarian cysts?* I quote from Dr. Mundé's essay,¹ page 81: "Of course, as Beard and Rock-

¹ The Value of Electrolysis in the Treatment of Ovarian Tumors, by Paul F. Mundé, M.D., New York. Reprint from Volume II., Gynecological Transactions, 1877, pp. 89.

well say in their book (page 739), referring to the claims that electrolysis and external galvanization have dispersed ovarian tumors, the difficulty of diagnosing ovarian tumors diminishes not a little the value of this claim."

Is it really so difficult to make the diagnosis of ovarian tumors? I may be allowed to say that in the great majority of cases it is not. There are obscure cases where only after careful study a positive diagnosis can be established, and there will always be a few cases where even the most prominent specialists remain doubtful or make mistakes. It is not necessary to cite examples. I, for my part, do not pretend to be above errors, but I believe I possess an average judgment on the matter, and as far as sincerity and honesty of purpose are concerned, professional and not professional, I will yield to no one. So much for the statements of Dr. Ultzmann, of Vienna.

The difficulty of diagnosis is really not so great as it is sometimes found suitable to make it appear, and if that were an argument against electrolysis, it would be much more so with regard to an operation with the knife. Whenever I believe I have to deal with a cystic tumor, and think myself entitled to thrust a needle into a woman's abdomen, will not that serve me equally well as an explorative puncture, as for the first application of electricity? Will the resistance the needle encounters not teach me (if I did not know it before) whether I have to deal with a solid body or with a liquid; will it not give me an approximate idea of the density of the liquid; will the more or less free movement of the needle within the cyst not show me whether I have before me a large or a small cyst? And if I introduce two needles at two distant points of the cyst and bring them in contact within the tumor, is that not a proof that there is a large cyst?

For whom has the late Prof. Middeldorpf written his essay on *akidopeirastik*?

Perhaps the majority of my cases have been cysts of the broad ligament? That goes against experience and statistics. Is the differential diagnosis between ovarian and parovarian cysts reliable? Some will say: Yes, it is. I say: it is not. Is it reliable to depend upon the examination of the fluid extracted by tapping? Spiegelberg and Schatz¹ have proved

that chemical analysis gives no diagnostic certainty as to whether a cyst belongs to the broad ligament or to the ovary, as there are cysts of the ovaries the contents of which are almost entirely without albumen, while there are cysts of the broad ligament that contain albumen. Some pretend that all unilocular cysts belong to the broad ligament, and Köberlé contends for extirpation of every cyst of the broad ligament. I have seen ovariectomy performed on a young girl by a great specialist, and the cyst was found to be parovarian. The girl died and the operator, when he told me so, added: "I am sorry I did not give you that case; the woman might live and be cured." I have seen another case where ovariectomy was not performed (though the diagnosis of an ovarian cyst was made by an eminent specialist) only because it was decided to tap before electricity should be tried, and when quite a thin and colorless liquid escaped, the cyst was at once emptied and the patient cured.

Of course I cannot, like an ovariectomist, lay before my readers, in the form of an anatomical specimen, the palpable evidence of the correctness of my diagnosis.

It has been reproached to me that my observations were not exact enough, that I do not give the dimensions of the tumors, etc. Where I was tolerably sure whether I had to deal with a monocyst or a polycyst, I said so; but I prefer to leave those cases that were doubtful to me, without a precise classification. It is not so easy to give in a few words a distinct idea of the size of a tumor; the size of an orange, of an apple, of the head of a child, are only approximate estimates. We have oranges from one and one-half inches to four inches diameter, apples of widely different sizes, etc. To measure the circumference of the abdomen is arbitrary; the general health of a patient may improve as the tumor gradually disappears, and a patient may be cured and yet be larger than before, unless we have to deal with very large cysts. To give an idea of the size of a tumor by weighing the patients is subject to the same objection. I think the best we can do is, to enumerate the points to which the dull sound and fluctuation in different directions extend; to the navel, above it, to the ribs, to the ensiform process, to the ant. sup. spinous process, etc.; that I have done.

2. I have been asked many times: *How does electricity act*

on the cyst? How is the cure effected? What is the rationale of its action?

Dr. Mundé says, on page 21 (*loc. cit.*): "Ultzmann offers a very ingenious and, I think, plausible explanation: oozing of the liquid into the cellular tissue or into the peritoneal cavity, and the liquid be thence absorbed," but on page 80, *ibidem*, we read: "Were his (Ultzmann's) supposition of cure by continual oozing into the peritoneal cavity through the needle punctures correct, a much larger proportion of monocysts would be reported cured," and on page 88, "Certainly not, as a rule, however, by the oozing," etc.

Dr. E. Cutter shares this opinion.

Several electricians as well as gynecologists speak of the influence of electricity on the nerves and absorbent vessels.

Dr. Macdonnel, of Montreal, Canada, says (Mundé): "In a case of multilocular cyst one cyst was emptied by tapping and one ounce of the liquid was exposed to the galvanic current: gases were developed and albumen coagulated. In ten minutes one drachm of liquid was destroyed. In another experiment, with two ounces of liquid in the same time, two drachms of liquid were decomposed. I will not undertake to explain that fact, but if it be so, in one pound of liquid, one ounce of it might be destroyed.

Dr. Althaus' theory as to the effect of electricity on tumors containing saline liquids, is, that the salt being decomposed, a caustic alkali is formed, and, by setting up a mild inflammatory process, increases the vitality of the tissues, and then leads to the absorption of the fluid.

Dr. T. Clemens, speaking of the introduction of needles and the use of the galvanic current, says: "A slight inflammation always takes place at the point of insertion of the poles, from these thrombosis starts the process which results in the atrophy and diminution of the tumor;" and, principally with regard to the faradic current, he speaks of "commotion (oscillation, vibration) of the molecules as facilitating the destruction of the liquid."

Dr. George M. Beard, of New York, says: "The object of using electrolysis in cystic tumors is not the decomposition of the fluid constituents, but the stimulation of the secreting surface so as to prevent further secretion and aid absorption."

I leave it to the judgment of my readers which, if any, of these explanations may seem to be the most scientific or intelligible, and declare that none of them satisfies me altogether.

I myself say in my pamphlet,¹ page 10, "Not only is the liquid absorbed, but the very wall of the cyst undergoes such a change that further secretion of liquid is brought to a standstill." This does not pretend to be an explanation, but is simply a statement of facts. If we had to depend only and entirely on the chemical decomposition of the fluid, it would probably require an enormous time to effect a cure; but, that part of the liquid is decomposed and destroyed is beyond doubt, whether that be our object or not. Wherever an electric current passes through a liquid, decomposition must take place and the same occurs in the living body. This decomposition is inevitably accompanied by development of gases, the quantity of which seems to be variable in different cases and never can be very great, considering the strength of currents we use, the length of time we use them, and that these gases at once enter into new combinations. Besides it seems to me that only under special circumstances of a case will it be possible to verify by physical examination that gases have been developed.

So far then we cannot satisfactorily explain how the electrolytic cure is effected. Can we then expect a scientific physician to apply a remedy the action of which he ignores? That would be gross empiricism.

We are proud of our scientific and rational therapeutics. But it might be questioned if medicine at large is a science at all or only a vast accumulation of experiences and observations, of more or less exactly studied facts, more or less reasonably explained. But if any branch of medicine does not deserve the epithets of "scientific and rational" it is precisely therapeutics. If an old woman or a shepherd employ some herb and alleviate certain disease by its use, it is irrational, but if Dr. Smith tries that remedy and finds it useful, and the more if he publishes a pamphlet on it and gives some kind of physiological explanation, it becomes at once a rational remedy and an enrichment of science.

Has it not so happened with hydrotherapeutics? As long

¹ On the Treatment of Ovarian Tumors by Electrolysis; reprinted from the New York Medical Journal, June, 1876.

as the Jesuits cured fever with cinchona bark it was only an empiric remedy; but now it is a scientific and rational one, because every physician uses it and because we have a theory to explain its effects.

Or is it otherwise with electricity? Do we know anything reliable of its *modus operandi*? And is electricity not a rational and generally recognized agent, because we know by experience that it has a beneficial action in a number of diseases? That which is just and right and reasonable in one respect ought to be so likewise in any other respect. If we are able to cure ovarian cysts by electricity, it must be a good and reasonable remedy for such cases, though we are as yet unable to say how and why it cures them.

How right is Benedikt¹ when he says: "It is an old caprice of physicians not to take notice of facts as long as there is no explanation for them."

3. But is "*electrolysis*" the proper word? May it not be more scientific to call our method *electrokatalysis* or *galvanism* or *electropuncture*? I will not discuss this point; I think *electrolysis* is just as good a word for the thing as any other; there will be no confusion, as we know what we mean by it.

4. When I speak of "*my method*" I mean "the method I use." I use a Calland's battery of twelve elements of zinc and copper, the surface of the zinc elements is two by sixty square centimetres; the liquid used is water in which crystallized sulphate of copper is dissolved; the elements are disposed so as to form a chain. I do not wish to say that any other battery similarly arranged might not be just as useful; but as with this battery I have obtained my cures, I feel safer in using it and do not intend to change it. The number and size of the elements give no proper idea as to the electro-chemical power developed, nor in fact as to the electro-motor power in any respect at our disposal; four elements do not give twice the power of two elements, and so on. Nor does the quantity of water or any other liquid, decomposed in a given time, give an exact idea of the power of a battery in all its senses. The same is the case with regard to the action of a current on a multiplier needle. A practical test of the power that may

¹ Dr. M. Benedikt, Ueber Nervendehnung. Wiener medizinische Presse, H. 30, 1881.

safely be used, is the impression both poles produce on the tongue of the operator; it must give a sensation, but not a pain. However constant a battery may be supposed to be, the only really constant action is the change.

I have, in different cases, used from four to twelve elements of said battery, and generally introduce one needle. I prefer to connect the positive pole with the needle, and apply the negative pole to a distant place of the cyst, so as to insure the passage of the current through a greater part of the cyst-contents. The negative pole is applied with a carbon electrode, a sponge, a metal electrode with wet blotting-paper beneath, indifferently. If I apply the negative pole with a bare metal electrode, so as to produce a little depression on the skin, and fill that depression with acidulated water while the electrode is in place, I observe electrolytic decomposition of the water, evolution of gases, and follicular blistering of the skin. So much for those who doubt the passage of currents through the cysts.

Sometimes the needle adheres quite firmly to the tissues, consequently, in withdrawing it, a certain force is required; now and then a few minute drops of the cyst contents escape through the puncture, or an insignificant cutaneous bleeding takes place, which is easily stopped by external application of the negative pole to the puncture.

The sittings I give last from five to ten minutes, and are commonly daily, and, if necessary, even during the time of menstruation. All the patients have been treated at my office but Case III.

My needles are of steel, and of the size of a common knitting needle, the points like those of a pin. Platinum needles are too soft and bend easily. I have never found a real advantage in the use of isolated needles and gave them up long ago. I have also tried needles with three-edged points; it is true they enter more easily, but I think the puncture they cause may gape, and allow liquid to escape into the peritoneal cavity, a thing I wish to avoid. The punctures cause a little pain, as is to be expected, and are rarely followed by a very limited local suppuration of the subcutaneous tissue. I find that the pain and inflammation (induration) caused by the

punctures is greater in patients with an abundant fatty layer in the abdominal wall.

I am always careful to have the patient's bladder emptied before I introduce the needle, and should never think of the application of electricity if I knew the contents of a cyst to be decomposed blood or pus.

The patients complain of pain or not, according to the application of more or less elements, and to their individual sensitiveness.

If any one thrusts a thorn or a nail in his finger, and afterwards feels pain and heat, are we in the habit of calling that at once "dermatitis, cellulitis subcutanea," and so on? If after the electric puncture there is some inflammation in the skin, or some pain or heat, or a very limited (to a few drops) suppuration in the canal, is that necessarily beginning peritonitis?

I never observed any noticeable inconvenience from the operation.

For the sake of completing my diagnosis, or for therapeutical purposes, I have several times introduced two needles, which, of course, cause a little more pain than one.

I have certainly tried to improve my method, and for that object have modified it in various ways, in order to make its application still safer, less unpleasant, and the effects quicker. I have tried other batteries, without advantage. I have introduced two needles, each of them connected with one pole; this modification gives more pain, and, as far as I see, no better results. I have also introduced two, and even three needles, all of them not isolated, at distant places of the tumor, connecting them with the positive pole, and applied the negative pole externally as above stated, hoping that the patient would be able to stand the action of twelve elements, if the current were divided in three branches, each of them connected with one needle. The pains have been greater and the effect not better, so I gave up all these modifications.

I have tried external electrolysis, too, or, as I prefer to call it, percutaneous galvanism, and the faradic or induction current; in no case have I derived a remarkable benefit from either, yet I confess I gave none of them a fair trial, as I disliked to discourage my patients by subjecting them to a treat-

ment in which I had no entire confidence, as I believe the chemical effects of the current to be essential.

Drs. Fieber and Clemens speak of the favorable effect of a combination of tapping and electricity. As will be seen in my cases, this combined treatment was several times applied. Only in one case did it prove advantageous; in the others, tapping caused peritonitic symptoms. There are many cases known of death rapidly following tapping.

Dr. Clemens starts from quite a different point of view when he speaks of the "electrolytic, catalytic and of the exciting and absorption-increasing power of the electric *molecular commotion*;" for that reason the faradic current is to him as much or more important than galvanic electricity.

Drs. Macdonnel and Cutter declare that, in the future, they will only use external galvanization.

Dr. Fromhold's two cases of cure of ovarian tumors by external electricity are mentioned by Dr. Moriz Benedikt in his "Nervenpathologie and Elektrotherapie," Leipzig, 1874, page 385, ad § 63.

5. *What becomes of the cysts?* As the healing gradually progresses, as the contents of the cyst gradually disappear, the cyst-walls retreat and shrink, and, in favorable cases, when the abdominal walls are very thin and the cyst does not adhere too low down in the pelvis, a small hard lump is felt in the place whence the tumor originated.

Dr. Ultzmann says: "The electrolytic treatment of ovarian cysts produces no radical cure." That is certainly going too far. Of course, a radical cure is always sure to be obtained by ovariectomy, if the patient lives. In that respect, ovariectomy and electrolysis ought not to be compared. We do not pretend to spay by electricity. Electrolysis is a conservative proceeding, therefore there will always be cases too far gone to be cured by it, and still amenable to be cured by ovariectomy. I have said in another paper¹: "An obvious advantage of the method is, that it does not deprive the patient of one of her most important organs.

Dr. Ultzmann claims to have seen many patients who were

¹ Dr. Fr. Semeleder, Transactions of the International Congress of Philadelphia, 1876, p. 859.

dismissed apparently cured after electrolytic treatment, return with their tumors as large as ever.

6. *When may a patient be considered permanently cured?* How long a time must have elapsed without a relapse to entitle us to speak of permanent cure? Dr. Clemens says: "No case should be put down as permanently cured unless one year has elapsed since the cure was apparently concluded." The time that elapsed in my cases since the patients were dismissed as cured, up to the time I write this paper, is from four years and six months (Case I.) to four months (Case XX.). In none of my cases that were dismissed as cured have I heard of a relapse. In the case of a so-called relapse, I maintain what I said in my first paper: "Such cases might be explained by the supposition that, when the cure was effected, some small cyst was already in progress of development, and had escaped the needles."

I repeat what I said, that, "if a patient be not relieved by electrolysis, she will not find herself in a less favorable condition for ovariectomy." Adhesions are exceptional accidents with the electrolytic treatment, and, if in some cases they have been observed, it does not necessarily follow that they must have been the consequences of the electric punctures, as adhesions are not uncommon even where no electricity ever has been thought of.

Whenever the champions of ovariectomy wish to cut short a discussion, they invariably bring forward three or four exceptionally skilful and happy specialists; but there are most prominent men who cannot boast of the same happy results. Did I not, during my stay in the United States, see nine ovariectomies performed, and the patients one after the other all died?

Ovarian tumors are met with all over the world; specialists exist only in a few large and populous cities, and unhappily most of our patients are unable to go abroad to put themselves under the care of those great specialists. How many cases will it require to become a specialist, and how many unfortunate results may not take place before any one reaches the acme of skill? It would take a century before any one of

¹ Dr. Th. Clemens: Ueber die Heilwirkungen der Elektrizität. Frankfurt-am-Main. Franz Benjamin Auffarth, 1879, p. 574, etc.

our physicians might have a sufficient number of cases to style himself a specialist.

It is probable that almost every successful case of ovariectomy is published; it is equally probable that ninety out of a hundred unsuccessful cases are not published. If we were able to put all those single cases together, the percentage would be greatly different.

I will do no one the favor to lay myself open to ridicule, by endeavoring to cast a doubt on the figures of Atlee, Spencer Wells, Lawson Tait, Keith and others. Yet they seemed so extraordinary that a man like Marion Sims undertook a voyage to see Keith and his proceedings.

Dr. M. S. Soriano, in "Anales de la Asociacion Larrey," Mexico, May, 1875, gives a statistic of the operations of ovariectomy performed in Mexico up to that date. It comprises 9 cases, with 2 cures and 7 deaths. Up to the date of this paper, my friend Dr. Fenélon estimates the number of ovariectomies performed in this country at 16. Having heard of a few more cases operated, I believe the whole number to be 20, with 3 cures and 17 deaths. According to the popular way of drawing statistical conclusions, the result would be 15 per cent cures and 85 per cent deaths. Let us now look at my cases from a statistical point of view.

The number of sittings was from six to one hundred and three; the time required for cure from one to nine months.

If we take the cases according to their anatomical characteristics, they read as follows:

Two dermoid cysts; 1 cured, 1 no perceptible effect; 2 fibrocystic tumors; decided improvement, 2; one of them, Case VIII., was afterwards admitted to a hospital, and was subjected to another method of galvanic treatment by Dr. F., though the tumor had not grown any more since my electrolytic treatment was suspended. Dr. F. employed a battery composed of a great number of small cells and isolated needles. Peritonitis set in, and the patient died. I believe that, as far as the chance of an electrolytic cure is concerned, cysto-fibromas ought to be ranged with fibromas, and not with cysts. I have applied Dr. E. Cutter's treatment to various cases of uterine fibroma, but my experience is not yet sufficiently conclusive to allow me to say anything on that topic.

In my cases of fibro-cystoma of the ovary, the liquid of the tumors has been diminished, but a complete cure has not been effected, and, I believe, cannot be expected.

Case III. cannot reasonably be considered as having been treated by electricity, as she had only three applications and then was tapped, and died from pulmonary emphysema. Yet the case is highly interesting in other respects.

Case VI. Dermoid cyst. The electrolytic treatment had only been applied once, when we tapped, hoping to gain time. This tapping was followed by peritonitis and suppuration. This case, as well as the former one, cannot be considered as failures of the electrolytic method.

Case IV. Temporary improvement; relapse; peritonitis after tapping. Ovariectomy performed in a hospital by Dr. L.; death.

Case XI. Treatment suspended after sixty-seven sittings, which produced a permanent improvement.

Cases XV. and XVII. have had a reasonable number of electrolytic sittings, without perceptible effect whatever.

If from the whole number of twenty cases, we deduct two cases of cysto-fibroma, which were improved, and two cases of ovarian cysts, which had almost no electrolytic treatment, there remain sixteen cases of ovarian and parovarian cysts, which were treated a sufficiently long time by electrolysis. Out of these sixteen cases, twelve are completely cured, one is permanently improved, one was temporarily improved, and, in two cases (XV. and XVII.), no perceptible effect was produced. I intentionally do not speak of so and so many per hundred, as long as I cannot dispose of at least a hundred cases.

As will be noticed, many of my cases were sent to me by my excellent friend Dr. Martinez del Rio, from the gynecological dispensary and hospital under his care. My heartiest thanks are due to him. All the cases were examined by him before treatment was begun, and when the patients were dismissed; his great experience and his agreement with my diagnosis have given me great comfort in many a case.

Cases of my first publication, *New York Medical Journal*, June, 1876.

Seven cases. Six cysts, five completely cured, one temporarily improved.

One fibro-cyst, permanent and decided improvement.

One of the cases, No. I., which in the above-quoted publication appears as completely cured, must now be classified as temporarily improved. This happened thus: I was induced into an error by the patient herself. In fact, at first a decided improvement had taken place, the circumference of the tumor had diminished. As I had to leave Mexico in 1876, the patient, who had come to me from Puebla, likewise left for her home and was put under the care of her family physician, who continued the electric treatment according to my instructions. Some time afterwards I received a letter from the patient, wherein she expressed her extreme gratefulness to me, and stated that she had continued improving and was then perfectly well. I have since then seen her again, as well as met her physician. She has a tumor larger than when the electrolytic treatment was first begun, and her physician informed me that, indeed, her condition had improved for some time at first, then the tumor, which is considered to be a monocyst, had again begun to increase, and finally every treatment was suspended, and the patient, who is still alive, was left to her doom.

Another of the above six patients, No. V., who is reported as completely cured by continuing the electric treatment after my departure from Mexico, died afterwards of hemorrhage after a miscarriage. I received about her the following account: Some time after the cure was effected, she noticed a new increase of her abdomen, and went to consult a physician. Believing the cyst had refilled, he tapped her. A few days later she had a miscarriage, followed by a severe hemorrhage, from the consequences of which she died.

The gentleman who attended her gives the following somewhat different history of the case. He says the cysts had really refilled; he tapped her, and as the cyst filled again, he tapped her again and introduced a drain; conclusion of the history the same as above.

I have to complain of several physicians who, having read my publications and tried electrolysis, were not able to resist the temptation of modifying and improving my method, as I describe it, before they had even tried it, and only on the ground of theoretical reasoning.

Dr. Mundé jocosely says (l. c., p. 2): "The ovarian tumors of our American women (at least in New York) refused to succumb to the insinuating means to which those of their Austrian and Mexican sisters had readily yielded." Did Dr. Mundé intend to say that the American women (at least in New York) are not very much like all other women? Probably not. Yet, is it true or not, that in eighteen years of practice I have only once applied a forceps to a Mexican woman, and that not for narrowness of

the pelvis, but for exhaustion from protracted labor; the Mexican woman, almost without exception, is of a splendid build, with wide and broad pelvis. Is it not strange that lacerated cervix is almost unknown here? Though I believe there would be more cases on record if Sims' speculum were oftener used. Why is abortion, without criminal interference, so exceedingly common here? Why are we comparatively often obliged to extract the afterbirth? Is it, perhaps, not true that uterine fibroids are very common with Anglo-Saxon women, and that there is hardly a negro woman above forty years of age without one or more fibroids in her womb; for which I have no less an authority than Dr. Marion Sims; while in Mexico uterine fibroids are comparatively rare?

But there is still another respect in which American women are different from the Mexican: the latter feel no enthusiasm nor eagerness for ovariectomy.

7. *The indication for electrolysis* is, that a patient have a cystic tumor; the only *counterindication* would be that her general condition is so much deteriorated that she is unable to stand even so mild a proceeding.

Dr. Mundé (l. c., page 88) gives the following indications:

1. Small monocyts, in which it seems fair to give the patient a probably innocuous chance of a cure by milder means.

2. Large unilocular or multilocular tumors, in which the presence of extensive adhesions renders ovariectomy impracticable.

As I have said before, I think in any case electrolysis might be tried, and, I should say, the thinner the contents of a cyst the greater the chance of an electrolytic cure. It is to be hoped that some day we shall be able to give precise indications as to which kind of cysts are most likely to be benefited by electricity and which less.

I think it not inappropriate to append a copy of a few lines from a letter of Dr. Martinez del Rio to Dr. Thomas Addis Emmet.

MEXICO, April 9th, 1882.

MY DEAR DOCTOR:—Our distinguished confrère, Dr. Semeleder, has written a most interesting memoir on the treatment of ovarian cysts by electrolysis, which will naturally come under your notice, because it is intended for publication in New York. I

wish, therefore, to explain to you that I have been an eye-witness of the remarkable success obtained by Dr. Semeleder, as well as of the truth and accuracy of his statements: indeed, some of the cases were directed to the doctor by myself, and others had been seen by me in consultation previous to his treatment, etc., etc.

P. MARTINEZ DEL RIO,

Late Professor of Obstetrics in the University of Mexico.
April 10th, 1882.

ON THE RELATION OF LATERAL CERVICAL LACERATIONS
TO CATARRH OF THE CERVIX UTERI AND THE
NECESSITY FOR EMMET'S OPERATION.

BY

CARL SCHROEDER, M.D.,

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WHILE Emmet's operation has held a rapid triumphal march through America, so that it appears to be performed in every section and by almost every gynecologist, Europe generally has maintained some reserve in regard to it. In Germany especially, the operation seems to have been received with strange indifference. Although no one has attacked it as unjustifiable or useless, it has received but lukewarm praise from some. That this fact is not to be ascribed to unfamiliarity with the operation will be at once admitted by every one who knows the strong operative tendency of younger gynecologists, and I am quite certain of it from personal observation.

The cause, therefore, will probably have to be sought in the difference in the results obtained. Inasmuch as experience shows that alternately good and bad results are a sign that the indications for an operation are not yet clearly defined, it might be worth while, in the first place, when subjecting the operation to a renewed discussion, to examine critically to which cases it is adapted and within which limits it is justified and indicated.

The investigation of this question is rendered particularly difficult by the fact that, in the great majority of the deeper lacerations of the cervix, catarrhal conditions of the cervical mucosa are encountered.

Hardly any gynecologist will go so far as to recommend the union of the margins of the cervix with the view to curing cervical catarrh; every one will, I think, admit that the inflamed mucosa is only hidden by this operation, thus rendering the topical application of curative remedies but more difficult. Emmet himself is so far from believing in the curability of cervical catarrh by his operation, that he makes the removal of the catarrh a preliminary condition to its performance; and he shows that he fosters no illusions respecting the facility of this cure by claiming several months for the treatment of the catarrh.

According to my experience, even this space of time is usually too short for a cure, and should it suffice, it may be asked, Is the performance of Emmet's operation still required after that?

In order to decide this question, we must first inquire: "Are cervical lacerations alone, *uncomplicated with catarrh of the cervical mucosa*, of sufficient importance to render the operation necessary?"

This question requires for its solution a review of a large amount of material, as deep cervical lacerations without catarrh are rarely encountered. But if a woman has a laceration of that kind, with normal, not laterally everted and profusely secreting mucous membrane; or should even—a frequent occurrence in such cases—the single layer of cylindrical epithelium of the cervical mucosa be supplanted by several layers of pavement epithelium, it is, according to my experience, the rule that there are no symptoms present which can be referred to these lacerations. Ordinarily, we find such completely cicatrized lacerations, not rarely extending into the vaginal vault, as accidental conditions while exploring for some other cause.

Of course, there are exceptions to this rule. In double deep lateral lacerations we hear, in many cases, complaints of pelvic pains which are increased especially by exertions and straining, as well as of functional disturbances in the use of the lower extremities. In these cases, we can usually demonstrate a condition which, to be sure, is much more frequent when complicated with cervical catarrh, viz., a pronounced tenderness of the angle of the fissure when touched with the finger or the

sound. Ectropion of both lips, too, is rather considerable, and it cannot be doubted that the pains are due in the main to the dragging at the angles of the rents during every downward dislocation of the uterus.

To a still higher degree is this true of the complication of deep lateral laceration with retroflexion. Thereby the ectropion is so much increased that the posterior and anterior lips are at a right angle at least to one another, and the treatment of the retroflexion, in the absence of a formed cervix, is often difficult or impossible.

In still other cases, there may occur with the deeper lacerations manifold nervous symptoms, the connection of which with the laceration may be disputed; the most remarkable case of this nature which has occurred in my practice is the following:

Mrs. V., æt. 34, was sent to me by Dr. Solger, with the remark that he inclined to the view that the main troubles of the patient were due to the cervical lacerations. The patient had been confined seven times; the last confinement, eleven months ago, had been normal; since then she complained of abdominal pains, lassitude, leucorrhea, and profuse, very debilitating night-sweats. Examination showed deep lateral lacerations of the vaginal portion extending into the fornix; the uterus and other pelvic organs were normal; the thoracic organs healthy. The patient, who was at first admitted for observation only, perspired indeed so profusely that all the bed-clothes were completely saturated every night. Emmet's operation having been performed upon her, the sweats at once diminished, ceased entirely after a few days, and did not return.

In all such cases it appears imperative to undertake the repair of the cervical lacerations to which the symptoms must be ascribed. Of course, should the indication for the operation be restricted to these cases, we shall but rarely be called upon to perform it. Therefore, in lacerations uncomplicated with cervical catarrh, I believe Emmet's operation to be one not often required, but under certain conditions necessary and curative.

It is more difficult to decide in regard to those cases in which cervical lacerations and catarrh are present at the same time.

Before entering more fully into this subject, we must ask ourselves the question as to the causative relation of these two conditions.

In the first place, I believe the view to be erroneous that the cervical catarrh is due to the laceration.

No one nowadays, I believe, will dispute that cervical catarrh of great severity occurs with an intact, and even frequently with a very narrow external os. Indeed, in these cases, the diseased mucous membrane is not seen until the cervical canal has been incised; and usually nothing but a small, distinctly circumscribed papillary erosion extending beyond the margin of the external os indicates the catarrhal condition of the mucosa within the cervix; or the round dark mouth of the womb betrays to the expert the fact that behind it lies a wide cavity filled with mucus, from which, however, pressure with the speculum will discharge a string of mucus into the vagina. Certainly it is easier to make a diagnosis of catarrh when, with severe ectropion, the internal surface of the two lips is immediately presented to the eye.

I cannot, therefore, admit that catarrh occurs almost exclusively in connection with lacerated cervix; nay, more, I am convinced, first, that the exposed cervical mucosa does not tend to catarrhal affections, but rather to transformation of the cylindrical into pavement epithelium; and, secondly, that the lateral lacerations do not induce the catarrh, but the reverse: the catarrh causes the laceration. Paradoxical though this may sound, I believe that there are good reasons for this opinion.

That, in the case of exposed cervical mucosa, the cylindrical epithelium shows a tendency to transformation into pavement epithelium may be frequently observed in prolapsus: to the extent of their eversion and exposure, the lips are often covered with pavement epithelium which exactly resembles that of the remaining vaginal mucosa; that subsequently at these places real ulceration may ensue is natural. This hardening of the cervical mucosa may be seen in its most perfect form especially in deep lacerations, as shown most clearly in the case reported by Veit (*Ztschrift. f. Geb. u. Gyn.*, II., p. 122), in which the exposed internal os was in a state of atresia, and the entire inner surface of the cervix conveyed the impression of vaginal mucous membrane.

For this reason I cannot admit the view to be correct that in the deeper lateral lacerations the exposed cervical mucosa becomes abraded and therefore catarrhally affected.

In my opinion, the reverse is true; the cervical catarrh causes the laceration, in this manner: During childbirth lacerations of the margin of the external os are of regular occurrence; they are sometimes only superficial, but occasionally extend deep into the cervix. These lacerations heal regularly, as in the involution of the cervix the margins of the wound are in apposition and adhere; small cicatrices remain which often are but little if at all palpable, and may be felt as cicatricial contractions only when, during a succeeding pregnancy, the surrounding tissue swells hyperplastically.

Obviously, the union of cervical rents must fail if their edges cannot lie in apposition, and in lateral lacerations this will necessarily be prevented by a hyperplastically everted mucous membrane. When, in the puerperal uterus, the cervix is re-developed, the anterior and posterior cervical walls lie in flat apposition and merge laterally in a very acute angle; in this condition, evidently, the chances of healing are most unfavorable for the laterally situated lacerations, the wound surfaces in the anterior and posterior lips being pressed closely together, while at the sides the hyperplastic mucous membrane inserts itself into the gap and thus prevents union. The next consequence is, that at these places the cervix does not develop normally, but remains quite thin—a condition well exemplified in unilateral lacerations, in which the thickness of the healthy side in the region of the internal os often differs strikingly from the greatly thinned wall of the injured side.

I maintain, therefore, that the previously existing cervical catarrh is instrumental in preventing the healing of lateral lacerations occurring in labor, and this is the cause of the great frequency of the complication of cervical lacerations with cervical catarrh.

In the majority of cases, then, we have to deal with cervical lacerations, ectropion of both lips, and cervical catarrh.

Opinions may differ as to which of these conditions is of greater pathological importance. At any rate, the ectropion is merely the result of the lacerations and the catarrh, because the two lips gape widely in consequence of the lateral fissures, and the hyperplastic mucosa extends beyond the level of the lips. The ectropion is besides made to appear still greater through the partial substitution by the catarrh of a cylindrical epithelium forming glandular depressions, for the normal

pavement epithelium of the vaginal portion. I certainly hold it to be incorrect to neglect the catarrh and to cure the laceration at once by Emmet's operation; for I believe the cervical catarrh to be pathologically of greater importance, and on that account place its treatment in the foreground. For the same reason I think Emmet's operation to be plainly counter-indicated while cervical catarrh still persists, because the gaping cervix greatly facilitates the local treatment of the catarrh, and the closed cervix renders it more difficult.

The treatment of chronic cervical catarrh complicated with great tumefaction, deep indentations of the mucosa, and manifold glandular proliferations, however, is difficult and requires a protracted length of time.

The employment of astringents and caustics leads to but temporary amelioration, not readily to cure. It is possible that the energetic use of the hot iron may produce perfect cure; I have never tried it, because I dread the complete destruction of the mucous membrane and the quite uncontrollable cicatricial contraction.

In my experience, cases of intractable chronic cervical catarrh may be quickly and safely treated by the method of excision of the cervical mucosa devised by myself. This procedure is the more advisable, because the repair of the lateral lacerations may be combined with it in the simplest manner.

I commence the operation by inserting Muzeux's double tenaculum forceps into both lips, and gently drawing the uterus as far downward as possible, preferably to the entrance of the vagina. For the purpose of disinfection I allow a stream of three-per-cent carbolic solution to run over the field of operation during the entire time of its performance. This irrigation, besides being antiseptic, has the advantage of continually washing away the blood, thus keeping the field of operation always free. I then incise the two lacerations still further with scissors, even in cases where they extend as far as the vaginal vault; thus the upper angle of the fissure is certain to be thoroughly and smoothly freshened. If then the two lips are widely separated, the diseased mucous membrane may be excised to any desired extent. To this end I make another incision in a transverse direction, according to the degree of the affection, in the neighborhood of the internal os, terminating on both sides in the lateral incisions. It is important that this

incision should not alone divide the mucous membrane, but also penetrate some distance into the wall proper of the cervix, be-



FIG. 1.

Schroeder's operation for excision of cervical mucous membrane and its replacement by vaginal mucous membrane in chronic cervical catarrh. *a*, Limit of incision; *ab*, flap of cervical mucous membrane; *c*, external margin of lip to be united to *a*.

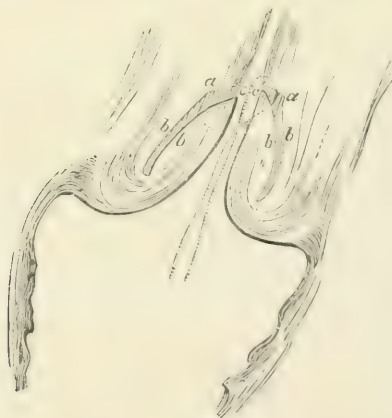


FIG. 2.

abc, Flap of vaginal mucous membrane turned into the cervical canal; direction of sutures.

cause the latter must be included in the sutures to be applied subsequently, for if the threads pass through the mucous membrane only they will cut through. A similar transverse incision is then made, likewise extending from one lateral rent to the other, externally at the extremity of the vaginal portion, or

rather in the healthy mucous membrane at the junction with the morbid portion, and the piece thus circumscribed is excised in approximatively wedge shape. The hemorrhage, ordinarily, as in all operations where the uterus is drawn strongly downwards, is very moderate, and is invariably arrested by a rapid insertion of the sutures. The latter, of course, are introduced from in front backward, in such a manner that the margin of the wound at the extremity of the vaginal portion is joined to the margin of the wound in the mucous membrane above in the cervix. After the posterior lip has been treated in the same way, it is left optional with the operator how far the cervix is to be united laterally: namely, either he applies several lateral sutures after the two lips have been but narrowly united, thus obtaining a comparatively long vaginal portion with contracted os, or he stitches both lips broadly, so that in each lateral incision there are but one or two sutures, thus securing a short vaginal portion with broad gaping os.

By this operation the catarrhal mucous membrane is removed, excepting a short stump situated at the internal os, and the lateral lacerations are made to disappear. Thus both indications are met by one operation.

After about ten days, the sutures are gradually removed and in two weeks the patient may be discharged cured.

I have performed this operation very frequently; I know it to be easy, certain to succeed, and entirely free from danger, and therefore recommend it warmly.

My opinion, consequently, is, that in cases where there are only cervical lacerations without catarrh, Emmet's operation is indicated whenever troublesome symptoms appear which are referable to the lacerations. In these, unfortunately rare cases, it is a beneficial, at times almost magically effective operation, and a very important advance in operative gynecology always to be linked to the name of Emmet. But in co-existing cervical catarrh the latter is of greater importance, and in these cases it is better, instead of first treating the catarrh and then repairing the lacerations, to excise the morbid mucous membrane and to unite the lacerations simultaneously by *one* operation.

THE DIAGNOSIS AND TREATMENT OF CHRONIC INFLAMMATION OF THE OVARY.

BY

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THE diagnosis of pelvic diseases may be said to have received its first real life from Simpson, for before his day no such attention was given to them as deserved the name of systematic study. He it was who established precise means of physical diagnosis, and upon that he reared methods of treatment which have made a lasting impression on our practice. Like all innovations, Simpson's methods led, even in his own hands, but mostly in those of his friends and followers, to an excess of zeal; and the mechanical school of gynecology, of which he was unquestionably the founder, led many to the belief that, armed with a sound, a speculum, a caustic stick, and some new-fangled pessary, the practitioner could subdue all the pelvic ailments of women. All these aids, valuable in their way, had their enthusiastic supporters, were declaimed against by others, did an infinity of mischief in their turn, and have finally been referred to more limited and less hurtful fields.

From the same phase of surgical development arose a number of operative proceedings, each of which has extended our means of relieving human suffering, but each of which went through a course of rough experimentalization which is now terrible to look back upon. Simpson found that division of the cervix relieved the sufferings in certain cases of dysmenorrhea and enabled sterile women to become pregnant. Immediately we had a flood of hysterotomies all over the world, and every sufferer had her cervix divided. Thousands of wholly unnecessary operations of this kind were, and still are, performed, and many deaths occurred from the practice.

Coincident with this innovation we had the employment of pessaries, fortunately a less hurtful practise, but carried to an

extent of uselessness which is positively amusing, and other illustrations of similar strivings in the dark might be given.

From the writings of Dr. Henry Bennett and Dr. Tilt, especially the latter, another new departure was derived, for attention was directed by these authors to the possibility of the ovaries being the seat of the troubles, relief from which was sought in the treatment of the uterus.

Still another impetus, and the greatest of all, in my opinion, was given to gynecology by Dr. Thomas Keith, who taught us that our traditional fear of the peritoneum was only a bugbear, and that it would serve us as well as any other part of the body, if dealt with fairly. After Mr. Spencer Wells had gone on for twenty years operating on hundreds of cases with a mortality of about twenty-five per cent, Dr. Keith persuaded us that ovariectomy could be done with less than six per cent of deaths. The mortality of Dr. Keith's practice and my own is now as low as three per cent, and this after we have both tried the so-called antiseptic system of Lister and have given it up as more dangerous than useful.

The outcome of such splendid work in the removal of ovarian tumors will soon be felt in very many ways, but in one it has already given evidence of another and altogether new direction for abdominal surgery. As long as Mr. Spencer Wells' example ruled our practice, and as long as his high death-rate was the best we could get, we operated on ovarian tumors only when they threatened life, and we delayed the case by mischievous tappings as long as we could. We were not justified in opening the abdomen for conditions whose severity did not threaten life. Now, however, when the removal of an ovarian tumor is fatal only when the patient has been tapped, or the operation injudiciously delayed, we are justified in performing abdominal section not merely for the saving of life, but for the relief of suffering.

This new practice has had many good results, not the least of which is that it is shedding a whole flood of light on the pathology of pelvic disease, and is even helping us to understand the physiology of the female sexual organs. Thus my own practice, the detailed results of which will shortly appear in a special work, have convinced me that the usually accepted

doctrine of the coincidence of ovulation and menstruation is wholly erroneous. The ovaries have nothing to do with menstruation; and though I give the opinion with a qualification which may be made necessary by further experience, so far the evidence before me shows that the phenomena of menstruation depend upon the Fallopian tubes and not in the least upon the ovaries. Finally, and of most importance for my present purpose, we are for the first time becoming cognizant of the real conditions involved in the disease recognized as chronic inflammation of the ovaries. For such a purpose as this an abdominal section has been well said to be of as much value as a post-mortem examination. I would say it is more valuable, for we have the recent and exact clinical record side by side with the morbid appearances.

We all know that in its healthy state the ovary is just like the kidney; it is an organ of the existence of which the owner is profoundly ignorant. Unless it becomes diseased it gives no sensation which indicates its presence. But when diseased, no organ in the body gives such discomfort, and its diseases are often fatal, this result being by no means confined to cystoma.

Acute inflammation of the ovaries is often fatal, and when not fatal it generally leads to a state which makes life-long misery. Though I have seen cases in which no history could be obtained of an acute attack, yet, like the same disease in other organs, chronic inflammation of the ovaries generally begins in the acute form.

The origin of the acute disease is various. It may be in a simple chill, in a hemothecoele, in an attack of gonorrhea, in some exanthematic fever or in miscarriage or childbed. The last two sources are by far the most common, and they present two specific varieties of the disease, interstitial oöphoritis and peri-oöphoritis.

Many of the cases of acute oöphoritis undoubtedly recover and leave no mischief behind, but in others the permanent mischief gives rise to suffering which to men is fortunately altogether unappreciated. Most patients will fix a date from which they tell you they have never known what it is to be well. A woman who has had acute exanthematic oöphoritis with permanent mischief will tell you that since she had the small-pox,

scarlet fever, or acute rheumatism, she has never had her periods as she used to have them. For a time they were more profuse than before, then they became scanty and painful, the pain increasing as time went on, lasting a week or even two or three weeks in every month, rendering her utterly miserable, and being relieved by nothing but narcotics. You examine the pelvis and find perhaps nothing at all. You give her iron and tonics and all sorts of drugs, and she is no better. She goes to one specialist and he divides her cervix or amputates it without relief, to another who applies some useless pessary, to another who puts in a galvanic stem, and so on, all in vain. If she marries she does not become pregnant. If she is in the better ranks of life, rest and luxury, with constant change of scene, make her life endurable; but if she is the wife of an artisan, her lot is one long unhappiness, till the climacteric has passed; and during that period of trial many of these women become drunkards.

Cases of chronic disease arising from acute peri-oöphoritis give usually more specific indications, at least to one accustomed to pelvic examinations. Suppose that it has arisen in some attack during the puerperal month, the patient will tell you that she was ill with "inflammation of the bowels" and was a long time in getting about, that she has never been pregnant since and is hardly ever free from pain. The majority of these cases occur in primiparous women, and therefore the first feature in the case to be noticed is often that the patient has had one child soon after marriage, and has never again become pregnant. If the patients are living a married life and bearing children, that alone is proof that they are not the victims of this disease, for it uniformly unsexes them as far as maternity is concerned. It also unsexes them for marital life, in all severe cases, for they cannot endure it; and in the milder cases they cannot get well as long as they have to submit to it.

As far as general symptoms are concerned, they are rarely free from pain, and this is greatly intensified during the menstrual week, for the reason that the tubes are always involved. In most of the cases, the tubes are chiefly at fault, for I often find the ovaries cystic and shrivelled, so as to be of little account in explaining the symptoms.

There is always pain on the left side, in the groin, for if one ovary is affected, it is sure to be the left. In the exanthematic cases we have to trust entirely to the story of the patient, to subjective symptoms, and therefore in this class of cases mistakes will be made until we arrive at a more perfect method of diagnosis. In the second class of cases, however, the objective conditions are easily recognized by the practised fingers. A fixed tender mass, composed of the enlarged and probably adherent ovary, or of the occluded and distended tube, will be felt perhaps on both sides of the uterus through the vaginal cul-de-sac, and the peculiar sickening pain felt by the patient when the mass is touched, will afford conclusive proof as to its nature.

What is to be done to relieve such cases? The general principles of treatment are those applicable to all such conditions in whatever part of the body they are met with. First of all rest—but unfortunately we cannot rest the ovaries or the Fallopian tubes. The former will go on trying to fulfil their function of ovulation, and every month, or oftener, the inflamed organs are temporarily congested by the occurrence of menstruation. Much may be done, however, by absolute rest in bed for the whole menstrual week and absolute abstinence from intercourse. It is very rare, however, that we can persuade patients to carry this regimen out long enough, and hospital patients will not attend to it at all, indeed they cannot. Counter-irritation, by blisters or setons, is also indicated. The only drugs of the slightest use are the salts of potash, and ergot.

After a persistent trial, if these fail, there remains for consideration the question of the removal of the diseased organs, a proceeding which is based on the soundest and most completely accepted rules of surgery. Let us take a perfectly parallel case. From some injury or gonorrheal infection, one eye becomes acutely inflamed, and the acute process is followed by intractable chronic inflammation of the structures—a matter of every-day occurrence. The ophthalmic surgeon removes the diseased organ to save the patient's discomfort, perhaps the sight of the other eye, perhaps even his life. He mutilates the patient most seriously in that part of the body where mutilation

is most dreaded. He removes a diseased and useless structure. We remove inflamed and useless ovaries and tubes to relieve suffering, in some cases to save life, and we do not mutilate our patients half so seriously as is done in the removal of an eye. The removal of a diseased eye often fails to save the other, and is then a useless operation. Removal of a cancerous eyeball is always a useless operation, for the disease always returns. Removal of the inflamed uterine appendages may yet turn out to be a failure for some cases, but it never can be so bad as the removal of an eyeball for cancer, and in the hands of experienced operators the operations have quite an equal risk. Besides this, the operation for the removal of the inflamed uterine appendages is, as yet, in its infancy; we have an immense deal to learn about it, yet, in spite of this, in my hands, of thirty-five cases there has been only one death, or a mortality of 2.85 per cent, a mortality which I have some reason to believe is less than that of excision of the eyeball. This one death was due to causes entirely preventible, and ought not to have occurred.

The operation is entirely justified by its primary success, and my belief is that my mortality, as my experience grows, will not be much more than one per cent.

Against the operation various *a priori* arguments have been brought. The first of these is, that it unsexes the patient. This is a perfectly needless argument, because the disease for which the operation is done has already accomplished this, as it has rendered her barren, and has made sexual intercourse a burden which she ought not to be called upon to bear. It has been said that removal of the uterine appendages destroys sexual desire, but the uniform testimony of such patients as have given evidence, is that it has no such effect. But suppose it did, what nature can any man have who would refuse to his wife relief from suffering because it would interfere with the gratification of his lust? I am surprised that such an argument has been seriously discussed.

It has further been alleged that useless operations will be performed. Until our powers are perfect this is very likely, but of what operation in surgery can this be denied? Have we not heard of lithotomies being performed where there was

no stone, amputations carried out where there was no disease in the joint? How many thousands of people have been cut for squint when what they really wanted was a pair of proper lenses?

As a matter of fact, I have found that the more serious discussion of the operation with a humbugging patient will lead to a diagnosis. If her sufferings are real, she will jump at this chance of relief. If they are not, she declines.

But such an operation as this demands the justification of ultimate success, and here we are on the most difficult ground. The most recent summary of cases to be found is in the second volume of Agnew's Surgery, just published, in which one hundred and seventy-one cases are tabulated, the work of forty operators, with a mortality of nearly nineteen per cent. This is quite a satisfactory explanation of the opposition with which the operation has been met.

I should long since have condemned the proceeding and have discontinued my practice if my mortality had been ten per cent. In fact, I did cease to operate for five years because my mortality was twenty per cent. Of the forty operators in this table, there are only three who have operated on fifteen or more cases, for all causes, not only chronic oöphoritis. These are :

Hegar,	42	7 deaths.
Battey,	15	3 “
Lawson Tait,	30	4 “
	—	—
	87	14 or 16.6 per cent.

Increased experience, therefore, brings better primary results, and this is more than ever visible if my whole experience is taken of seventy-five cases, with only six deaths or eight per cent. Of my recent experience of sixty-one cases, there have been only three deaths or five per cent, and confining it to the cases of chronic oöphoritis of thirty-five cases, there has been only one death or 2.85 per cent. It is clearly, therefore, an operation which can be justified by its primary success only in the hands of a surgeon who has large and constant practice in abdominal surgery; and when it is done by a large number of operators in twos and threes, it can only meet with speedy and well-merited condemnation.

Precisely the same kind of argument applies to its secondary results which, in the hands of inexperienced operators, are admittedly bad. For my own results, so far, I have abundant cause for satisfaction. Some of my cases are yet incompletely relieved, but by far the majority of them are absolutely cured. The first patient from whom I removed an ovary for pain, nine years and a half ago, was completely relieved of her symptoms, and she remains so to this day.

I cannot burden this paper, already too long, with the recital of cases, but two I shall give as samples of what may be done by this operation; and I select them only because, having been promptly cured themselves, they have ever since been actively engaged in helping to cure others as surgical nurses. One of them is now attached to my own private staff, and has materially assisted in the recovery and cure of many of her suffering sisters.

I.—E. B., aged twenty-four when placed under my care by Dr. Hammond, of Nuneaton, had enjoyed perfectly good health until she was seventeen years old. At that time she had some kind of low fever, the nature of which she did not know, and no history of it could be obtained. During its progress she suffered greatly from pelvic pain, and was nine months in getting better, but practically she has never been well since. She has never been free from pain in the back and in both groins, the pain running down both thighs and being greatly intensified just before and during each menstrual period. She has had a great variety of treatments, the general view being that there was some displacement of the womb. Several operations had been performed, and she wore pessaries for some months. The result of all this was that she steadily got worse, and for three years before being placed under my care she had been a helpless cripple.

Her general appearance was that of good health, in fact she was distinctly robust in appearance. The menstruation was regular but scanty, seldom lasting more than two or three days, and during that time she described the pain as being agonizing, and those who had watched her saw no reason to doubt her words. My diagnosis in this case was that of cirrhotic oöphoritis, the result of the acute inflammation of the exanthematic variety. I proposed to remove the glands, but when the whole features of the proposal were explained to her, she promptly declined to submit to it and left the hospital. In October, however, she voluntarily returned and begged me to operate. I complied with her request upon October 15th, and found the ovaries small, atrophied, and adherent. They offered in fact typical examples of the changes effected in the glands by this disease. The tubes were also adherent, small, and atrophied. The removal of the appen-

dages was difficult, as it nearly always is in such cases. She made a rapid recovery, and left the hospital early in November.

She did not menstruate till the end of April, 1880, and at that time declared herself greatly improved.

I lost sight of her till the 8th of this month (September, 1881), when she came to show herself as a perfect cure. She had been for nine months, and is now engaged as a surgical nurse in a large general hospital, is perfectly fit for her arduous duties, and says she is in perfect health. She menstruates occasionally, but entirely without pain.

II.—J. W., aged twenty-four, began to menstruate at thirteen, and was regular and free from pain till she was nineteen. Then she had an acute illness, and ever after suffered intense pain for two days before and during the whole of her periods. The amount of loss became very profuse. She was admitted to Leicester Infirmary, and was there for many months and obtained considerable relief, the treatment being to a large extent local, by pessaries, etc.

After this she went out to service, but had to leave every situation on account of being wholly unfit for work for the greater part of the month. She was treated in several medical institutions, but obtained no permanent relief, and ended by becoming an out-door pauper. She was sent to me in July, 1880, when I found the ovaries large and tender, and fixed down behind the uterus. I removed them and the tubes on July 18th, the operation being a very difficult one. The glands were both cystic, and the tubes occluded and distended. She recovered speedily, and in a few weeks entered upon her duties as a nurse. These she has fulfilled under my directions ever since, save in an interval during which she had an attack of scarlet fever. She has never menstruated since, and has remained perfectly free from pain. She is constantly engaged in nursing abdominal sections, and is one of the best nurses on my staff.

THE OPERATION FOR PROLAPSUS UTERI OF SIMON-HEGAR VERSUS THAT OF BISCHOFF.

BY

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IN an article which appeared in the October number, 1878, of this JOURNAL, I gave a description of Bischoff's operation for prolapsus uteri. As the reader will remember, the main feature of this method of kolpoperineoplasty consists in forming, out of

the posterior wall of the vagina, a flap which, after freshening the posterior half of the vulva, is brought forward in a manner which may best be understood by a glance at the following diagram (Fig. 1). After the wound is healed, it will be noticed

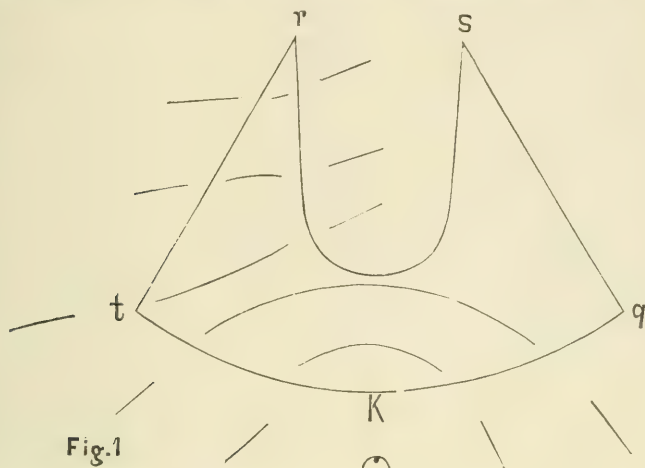
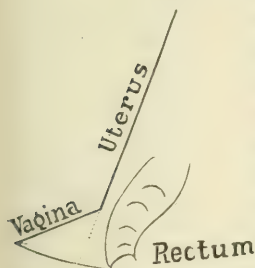


Fig. 1

that the lower part of the vagina is considerably narrowed, while, at the same time, the vaginal axis is broken so as to form an angle with the axis of the uterus (Fig. 3). Thus, it is

Fig. 3



claimed, the narrowing of the vaginal outlet, as well as the change in the direction of the utero-vaginal axis, together prevent the womb from protruding through the vulva. It is arrested in a sort of anteversion at the neck of the angle which the vaginal axis now presents. In my conclusions as to the value of this operation, I declared myself fully satisfied that it could be done in any case of prolapse, and would always promise a fair result. This was, then, no

mere "*manière de parler*," for the many operations I had seen performed after this plan, and the number of cases I had examined years afterward, justified me in making such a statement.

However, shortly after the publication of said article

CASE I.—I was consulted by Mrs. K. of Chicago. She was a healthy-looking, strongly-built, fat woman, æt. 53, had borne four children, and suffered since her third confinement (twins), eighteen years ago, with total procidentia of the womb. On ex-

amination, the patient being in the recumbent position, I found the whole uterus outside of the vulva. It was easily replaced, but protruded again as soon as I removed my hand. The posterior wall of the vagina was the first to protrude, forming a rectocele larger than a fist, after which followed the uterus with a cavity measuring eleven centimetres in length. For the last five or six years the woman was unable to keep the uterus in position, all pessaries slipping out, other appliances causing too much discomfort. Whenever she had to pass water or go to stool, she was obliged to first replace the procidentia and keep it in situ with her hand until bladder or rectum were emptied. The mucous membrane covering the rectocele had entirely lost its natural structure. From constant exposure to the air and chafing, it had become dry, epidermis-like, besides being so thinned out by atrophy that it seemed not to be any thicker than common writing paper. This was, of course, no good material to form a flap with. I anticipated gangrene of the flap if I should operate after Bischoff's method, so I concluded to follow in this case the plan of Simon-Hegar. Of this, the following sketch gives an idea.

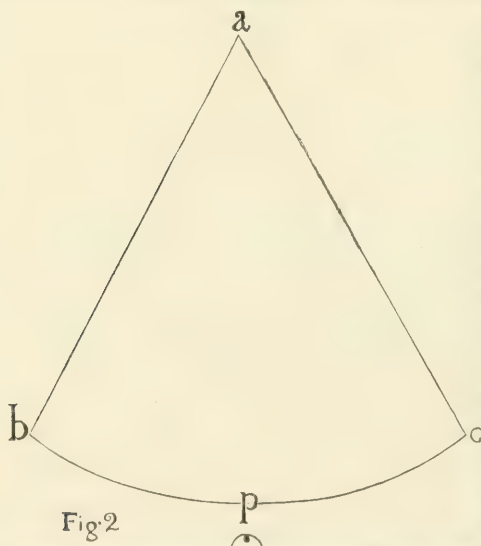


FIG. 2.—This cut is defective as far as it fails to mark the sutures by which *ba* is united with *bc* (vagina), and *bp* with *pc* (perineum).

In my case, *a* corresponded with a point about two centimetres distant from the posterior lip, while *b* and *c* reached up to the middle of the nymphæ on either side. In this manner the whole rectocele was denuded, and I must confess the huge wound finally offered quite a terrible aspect. However, the sutures were applied with no undue tension. The patient had slight fever from third to seventh day; on the twentieth day I removed the stitches, the whole wound having healed by first intention. It is now over three years

since the operation was done. The woman is perfectly cured, she rents out rooms, does a great deal of work, and lodges in the third story.

CASE II.—A similarly bad case was that of Mrs. M., of Chicago, German by birth, æt. 42. Has had two children and one miscarriage; last confinement eleven years ago, since then total procidentia. Patient is healthy-looking, well-nourished, of nervous temperament. Total prolapse of the uterus which is easily

reduced in the recumbent position, but escapes as soon as the woman gets on her feet. The uterine cavity measures ten centimetres; there is a bad-looking, torpid ulcer, as large as a fifty-cent piece, in the middle between posterior lip and posterior commissure. The patient thought that this ulcer was caused by a pessary which she had laid aside about six months previously. As there was a decided tendency to cystocele, I first performed anterior elytrorrhaphy by excising an oval-shaped piece of mucous membrane four by six centimetres. On the fourth day, the patient had an attack of vomiting and diarrhea, which was followed by a slight bleeding from the vagina. Otherwise she did well, but when on the tenth day I looked after the stitches, I found that the wound had partly separated and that there was a granulating surface about one inch in diameter. It took about three weeks to heal it, as the patient was not to be kept in bed any longer. To the ulcer at the posterior wall I applied an astringent ointment, but with no avail, for the same reason. Five weeks after performing anterior elytrorrhaphy, I proceeded to make kolpoperineorrhaphy. The presence of an ulcer rendered it utterly impossible to shape out of the posterior wall of the vagina a flap well supplied with blood-vessels. So I was obliged to denude as in the first case. I excised a triangular piece of mucous membrane which measured ten centimetres in length (*a-p*, Fig. 2) and eight centimetres at its base (*b-c*, Fig. 2), the ulcer being included in the triangle. The wound healed by first intention with almost no fever. Three weeks after the operation, the patient arose, and was doing nicely until about the middle of November, when she had an attack of rheumatism and bronchitis. For several weeks she coughed, sometimes very badly, the more so as she could not take the smallest dose of opiates without vomiting and headache. She had hardly lost her cough in January, when she was laid up with vomiting and diarrhea, "winter cholera" as we then called it in Chicago. This again lasted several weeks, and I must confess I often called on Mrs. M. with the apprehension of finding the womb in the vulva, and the old affliction brought back on the poor patient. However, in spite of all untimely complications, the vagina would not yield. I saw Mrs. M. a few days ago; she is well, nineteen months since the operation.

I have another case even worse than the two I have just related.

CASE III.—Mrs. H., German by birth, æt. 60. She is a healthy-looking, well-nourished, strong woman; has borne nine strong, hearty boys, the youngest being nineteen. For the last twenty-two years she had been suffering with total procidentia. For the last ten years she has used no more pessaries, everything being useless. The womb could easily be replaced, but would soon slip out after removing the hand, whether in the recumbent or erect position. For the last five years the woman constantly

wore as a kind of supporter to the whole mass, which she carried between her thighs, a pair of suspenders which she borrowed from her husband, and which she tied over the right shoulder. One would not think it possible that a person in such a miserable condition could enjoy life, and yet, during the last three years, I have seen this woman doing her own house-work, washing and carrying, always in good spirits, so that I can hardly describe my astonishment when, in September, 1881, she for the first time consulted me for her uterine disease. The womb, together with the whole vagina, was prolapsed. The orifice of the urethra was drawn out from under the symphysis, looking directly upward. The fundus of the telescoped uterus could easily be grasped through the walls of the vagina. The mucous membrane of the vagina had lost all its natural character. Around the outlet it was hypertrophical, of elephantiasis-like structure. Higher up it was exceedingly thin, atrophied, and ulcerated. In two places there were varicose knots of the size of a large pea. A torpid-looking ulcer from three to five centimetres wide, covered the middle of the anterior wall, while several smaller ones were scattered over the posterior wall.

There being a great superabundance of vagina, I first excised an oval-shaped piece of the anterior wall five by six cm., taking care to remove in this manner the whole ulcer. In closing the wound, I experienced great trouble, as the sutures cut through on the slightest tension, the edges of the wound being so brittle. In order to prevent the womb from protruding, and thus tearing open the wound, as happened in the second case, I introduced a cup-shaped supporter, which was fastened to a leather strap around the waist. It did well for three days, when it began to incommode the patient, so that one night she removed it for a little while—just long enough to let the womb again protrude. The wound again separated, and had to be allowed to heal by granulation. As the woman was anxious to conclude the radical operation, I concluded to perform kolpoperineorrhaphy before the elytrorrhaphy wound was healed. The condition of the posterior wall of the vagina was such that Bischoff's operation was entirely out of the question. There was no healthy flap to be obtained. I again resorted to the Simon-Hegar method. The point *a* (Fig. 2) was two cm. distant from the os. From *a* to *p* (Fig. 2) I measured thirteen cm.; from *b* to *c* ten cm. I have never seen so large a wound for this operation. Twelve stitches were necessary for the vagina, five for the perineum. On the second day, rather high fever set in, 101° F., with a chill, and kept up for three days, when the temperature was normal, and continued so. On the sixteenth day, I removed the stitches, the wound having healed by first intention. I saw the patient to-day, May 14th. She is as well as possible, and does her own work. The vagina stands as firm as the day I removed the sutures.

I now wish to add a few general remarks.

In all of the three related cases, the formation of a flap from

the posterior wall was utterly impossible; in the first instance, on account of the atrophic condition of the mucous membrane, which suggested that gangrene of the poorly-nourished flap might frustrate the desired result; in the other two cases, ulcers, unfortunately located in the very region from which the flap had to be taken, forced me to resort to Simon-Hegar's operation. Before I had seen these cases, I never thought of such a condition of things being possible, and I am sure neither did Bischoff. The only way I can account for it is that, at Bischoff's clinic, at Basle, such complicated cases had never presented themselves for operation. The last reported case, especially, was such a one that all the gentlemen who kindly assisted me declared it quite a novel occurrence to them. Moreover, they expressed some very strong doubts as to the possibility of permanently retaining, by operation, such a heavy uterus. *I deem it my duty to revoke the statement made in my former article as to the feasibility of Bischoff's kolpoperineoplasty in every case of prolapse, however complicated. More extended experience has shown me that this more justly applies to the Simon-Hegar mode of operating.* By this I do not intend to discredit the good results obtained by Bischoff's operation in cases where it is applicable. I have myself seen too many cases permanently cured by it. But I feel rather inclined to adopt for the future Simon-Hegar's operation, because this method has helped me out of difficulties which otherwise would have been insurmountable.

Hegar's kolpoperineorrhaphy is by no means a difficult operation, especially not in those cases of total procidentia, where the whole field of operation lies outside of the vulva. But it is sometimes very tedious. In the first case related, it took me three hours. The paring has to be done carefully, this being a very essential point to insure uniting by first intention. The beginner will find some difficulty in deciding how much of the posterior wall of the vagina should be denuded. Hegar gives as the average for the distance *b* to *c* six to seven centimetres; from *p* to *a* seven centimetres (Fig. 2). However, experience alone will teach the operator to properly judge in each case of the extent of mucous membrane to be excised without causing too much tension upon the edges. I am of the opinion that the point *a* (Fig. 2) ought to be carried up as near the cervix as possible. Contrary to Hegar, who forms sharp angles, I round

the upper angle, as was the old plan of Simon. There is always a superabundance of material high up in the vagina, so that the edges of a wound an inch wide can be easily brought into contact almost without stretching. I hold that by pushing up the paring so high, the uterus will also be retained at a higher level. In fact, it will stop where the vagina fails to follow its descent. Now that is just where the denudation ends.

In the two cases in which I performed anterior elytrorrhaphy, I failed to get first intention because the womb forced itself out, thereby tearing the wound open. To-morrow I shall perform kolpoperineorrhaphy in a case in which I secured union by first intention of anterior elytrorrhaphy by proceeding in the following manner: After sewing up the wound, and thoroughly cleansing the vagina with a two-per-cent carbolic solution, I filled the whole vagina with a iodoformed cotton. Five days ago, I had the stitches removed, when the whole wound was found to be closed by first union.

I always thought that anterior elytrorrhaphy was essential to secure a good result in any severe case of procidentia. However, the two last-reported cases go far to show that the assistance to be derived from such a primary operation has been greatly overrated. Anterior elytrorrhaphy had failed, and yet after kolpoperineorrhaphy the prolapse was cured. Nevertheless, I shall continue to make anterior elytrorrhaphy, especially where the bladder descends very low.

The text-books say that, before undertaking any operation, complicating ulcers, irritations, etc., ought to be cured. My experience shows that much time is lost in attempting to cure such sores as long as the womb is outside, and that ulcers heal readily without any further attention than cleanliness as soon as the uterus is retained in the vagina.

The final result of kolpoperineorrhaphy entirely depends upon strict obedience to antiseptic principles. With it, first union will always be obtained. For sewing material, I used carbolized silk; for ligatures, catgut. The after-treatment is very simple.¹ I have the vagina syringed twice a day with a two-per-cent solution of carbolic acid. I use no T-bandage; the catheter only if absolutely necessary. The bowels are regulated by Hunyadi Janos Water. I insist on a dorsal posture, the knees slightly bent over a roller.

¹ In the next case, I intend to pack the vagina with iodoformed cotton, which I expect to leave until the stitches are removed.

Mrs. H——, my third case, had high fever for four days. There was a granulating surface on the anterior wall of the vagina at the time I performed kolpoperineorrhaphy on the posterior wall. This ulcer was discharging freely. For four days it absorbed foul matter, *i. e.*, its own discharge, which had become decomposed while in the vagina. Finally, repeated antiseptic injections neutralized the poison, and thenceforth there was no more fever. The wound proper healed readily by first intention. It seems out of question that the intensity and duration of fever caused by the absorption of foul matter depends upon the quantity of it that has entered the circulation. So we may have fever as long as there is septic material ready for absorption; but it will disappear as soon as the continued use of neutralizing, *i. e.*, antiseptic washings has rendered the poison harmless, while, at the same time, the healing process of the wound has closed the door through which the toxic matter enters the circulation.

It takes about three weeks after the operation before the stitches are removed and the patient should be allowed to go about. In case of anterior elytrorrhaphy, two more weeks are required.

FIBROMATA AND CYSTO-FIBROMATA OF THE OVARY.

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(With four woodcuts.)

It must occur to every one who has had occasion to review the literature of new growths originating from the female pelvic organs, to note how large a space is reserved for tumors of the ovary. Aside from the attention which has been bestowed on this organ, because of its immense physiological importance, and subtle influence upon the system at large, it occupies pathologically a prominent place as the site of a peculiar variety of morbid growths. In all the monographs which have been written upon ovarian tumors (especially the works of Spencer Wells, Atlee, Peaslee, Tait, and Gallez¹), it is almost entirely of the

¹ Vide also Olshausen, "Ovarien;" Kiwisch, "Dis. of Ovaries" (Clay's Trans.), etc.

cystic, seldom of the solid, type that we read. While the minute anatomy, origin, and development of the former are treated of at length, the latter are dismissed with the brief comment that they are of rare occurrence and little understood. Nor should it appear surprising that they are so imperfectly described in treatises, largely clinical in their tendency, when we remember the comparatively small size and little surgical importance of many of these tumors. That they are so rare as ordinarily represented,¹ the writer cannot believe, yet they are sufficiently uncommon to invest them with great interest. No doubt many have been overlooked during life, and even in the dead-house, while the published reports of cases are often meagre and indefinite.

As a rule, clinical writers are content to take their pathological anatomy at second-hand, so that for all the information which we possess on the tumors under consideration, we must appeal to the original sources, the works of the French and German pathologists. Aside from the short section in Virchow's great work² devoted to this subject, no special investigations had been made till the appearance of Leopold's article in 1876.³ The latter tabulates only fifty-nine cases, by no means a complete collection, as will appear from reference to a single source.⁴ Nearly all subsequent observers have referred to his paper, just as previously Virchow and Cruveilhier were quoted as chief authorities.

Leopold has certainly done much to direct the attention of pathologists to the fact that ovarian tumors are not entirely cystic in their nature, but that solid growths may originate in this region, possessing some histological, if not clinical, interest. Though the entire class will claim our careful attention, the writer has thought best in this paper to confine his observations more particularly to a small group—the fibrous tumors, because of, (1) their rare occurrence, (2) their doubtful origin, and the similarity of their structure to that of the normal ovarian stroma, (3) the appearance of similar growths in the

¹ It is rather remarkable that Leopold should have overlooked so many cases reported by English writers. Only Van Buren in America and Spencer Wells in England are credited by him, each with a single case.

² Virchow: "Geschwülste." Chap. on Fibromata.

³ Leopold: "Die soliden Eierstocksgeschwülste." Arch. f. Gyn., Bd. vi., S. 189.

⁴ Trans. London Path. Society, Vols. viii. to xxix.

uterus (less often in other organs), thus affording an opportunity for valuable comparisons, (4) the fact that there exists the same tendency to cyst-formation as in uterine fibroids.

Of Leopold's fifty-nine cases, but nineteen are examples of true fibromata, and he infers that some of these were probably sarcomata. The impossibility of drawing this sharp distinction will be referred to later. The writer has collected authentic accounts of upwards of twenty other cases, to which may be added another which came under his personal observation last winter at the Woman's Hospital.¹ In this instance, there was bilateral disease, one tumor being a large fibro-cyst, while the opposite ovary was the site of a smaller fibroma. An examination of these specimens suggested the present study.

One other similar case has come to the writer's knowledge within the last few weeks, and reference to the Transactions of the Philadelphia Obstetrical Society (Dec. 1st, 1881)² shows a report of three ovarian fibroids removed by Dr. Wm. Goodell since 1876; so that we are forced to differ with the latter gentleman when he says that "fibroid tumors of the ovary are *very* rare, so rare, indeed, that many pathologists have contended, etc." When compared with the frequency of their occurrence in the uterus, we grant that they are uncommon; and just here it is interesting to note the inverse ratio between the number of solid and cystic growths found in the two organs, suggesting a difference in the etiology of uterine and ovarian tumors. This idea will be referred to later.

Believing that light might be thrown upon the subject from more than one quarter, the writer has taken advantage of the rich pathological collection of Bellevue Hospital Medical College,³ and examined microscopically a number of fibro-cysts of the uterus, one from the kidney, and several sarcomata and carcinomata of the ovary, as well as about thirty cystomata obtained from the Woman's Hospital. All the fresh specimens removed at the latter institution during the winter have been laid under contribution. In a number of autopsies, the ovaries have been examined with reference to the presence of the so-called "fibroid" and "hyaline" degenerations, in the hope that

¹ Removed by Dr. Thomas. Patient made a good recovery.

² As reported in Supplement to AM. JOURN. OBSTET., March, 1882, p. 74.

³ In this connection the writer would express his grateful appreciation of the kindness of Dr. Welch, whose instruction he was so fortunate as to enjoy.

some information might be derived relative to the development of fibromata.

In general, Dr. Noeggerath's assertion has proved true, that a strictly normal ovary is the exception.¹ Whether any new facts have been gained by these studies or not, the writer has at least deduced one valuable lesson—that even the most careful investigators are too prone to establish a theory, and to endeavor to make their observations conform to it. No attempt is made in this paper to support any new or original theories, but simply by legitimate deductions to confirm or disapprove those which already exist. The writer has tried (as much as one can, for the personal equation in microscopy is very variable) to describe only what he *saw*, and not what he *wished to see*. Even if this course leads to a confession of ignorance, it will at least be an honest ignorance.

A glance at the literature of the subject will not be without interest. In all cases the original works have been consulted.

Astruc,² writing in 1743, says nothing of tumors of the ovary, either solid or cystic, though he describes with considerable accuracy those of the uterus, and shows that he was well acquainted with the changes to which fibroids are liable.

Kiwisch³ devotes but a few words to the subject, dismissing it with the simple statement that we find (1) solid fibroids of the ovary, and (2) cysts "with fibroid thickening," the first class being very rare.

Simpson,⁴ writing about the same time (1845), makes no mention of these growths, nor does Bennet,⁵ whose attention was directed especially to "inflammations" of the uterus. Lee,⁶ at the same period, in a treatise on tumors of the latter organ, notes the concurrence of fibroids in the ovary and uterus, and the *identity* of structure in both cases. He quotes Mad. Boivin, to the effect that "all large solid tumors of the ovary are scirrhus"(1). West,⁷ contemporary with the above, devotes the second volume of his work to diseases of the ovary, yet without reference to fibromata. Mad. Boivin,⁸ in her original treatise,

¹ Noeggerath: On a New Method of Formation of Ovarian Cysts. AM. JOUR. OBSTET., 1880.

² Diseases of Women. Ed. 1743, Chap. xiii.

³ Dis. of the Ovaries (trans. by Clay), chap. xxiii.

⁴ Dis. of Women.

⁵ On the Uterus.

⁶ Tumors of the Uterus; Jacksonian Prize Dissertation, London, 1847.

⁷ Dis. of Women. Vol. II. On the Ovaries.

⁸ Treatise on Dis. of the Uterus. Eng. trans., 1834, Chap. iv., p. 477.

says that "tumors of this kind (*i. e.*, fibrous) are sometimes attached to the ovarium, as well as to the uterus, or formed in its tissue like globules." Tilt,¹ while developing at length his peculiar ideas on ovaritis, makes no allusion to hypertrophies, or new growths of the organ. In France, however, Colombat² had already noted "scirrhus induration" (perhaps following Boivin), and refers clearly to "fibrous transformations of the ovary, which bear a strong analogy to those of the uterus," etc. Velpeau³ mentions uterine, but nowhere ovarian, fibroids.

Other English authors of later date are equally cursory in the attention which they give to the subject, though at this very time reports of undoubted cases were frequently made at the London Pathological Society.⁴

Bright⁵ mentions but one case, which may have been a fibroma of the ovary. McClintock⁶ is equally unsatisfactory, quoting from Paget,⁷ who himself speaks only of "fibroid cancer." Hewitt⁸ refers to the "rare fibrous tumors of slow growth and comparatively harmless," while Tait,⁹ in his last edition, makes the strange remark that "growth of the fibrous stroma of the ovary, so as to form a large abdominal tumor requiring removal, has not yet been described." He admits that he has seen but two cases of ovarian fibromata, "one of which was malignant." Athill¹⁰ says nothing of this variety of tumors. Duncan¹¹ merely hints at a possible hypertrophy, "which may be called areolar hyperplasia, or increase of fibrous tissue." In their last edition, West and Duncan¹² note that "solid tumors of the ovary are comparatively rare," and that they have never met with one. Reference is made by them to Leopold's paper.

According to Barnes,¹³ "fibrous or fibro-muscular tumors of

¹ Dis. of Menstruation and Ovarian Inflammation.

² Diseases of Females. Trans. by Meigs, 1845.

³ Mémoire sur l'Anat. Path. des Tumeurs Fibreuses de l'Utérus, 1842.

⁴ Vols. ix.-xxviii., Trans.

⁵ Clin. Memoirs on Abdom. Tumors.

⁶ Clin. Memoirs on Dis. of Women, p. 114.

⁷ Surgical Path.

⁸ Dis. of Women, p. 699.

⁹ Dis. of Women, Wood's Ed., p. 148, also Prize Essay on Ov. Dis., Brit. Med. Journal, Vol. i., 1874. He only speaks of the rarity of "fibromatous" tumors of the ovary.

¹⁰ Dis. of Women, 5th ed.

¹¹ Clin. Lect. on Dis. of Women. ed. 1881, p. 27.

¹² Dis. of Women, last Ed., p. 588.

¹³ Dis. of Women, last Ed., p. 283, seq.

ovary are so rare that their existence has been doubted . . . at the same time there is a sound histological reason for admitting the possibility, etc." "A true fibrous tumor of the ovary," says Spencer Wells,¹ "is a thing of very rare² occurrence, so rare indeed, that until the present year not one, distinctly characterized and taking its origin in the ovarian tissues, ever came under my observation." In fact, he is sceptical as to the origin of these growths, believing that their true site is in the uterus. Kiwisch is quoted as reporting two cases, though the writer has not found them mentioned elsewhere. In a work by Edis,³ giving presumably the latest English views upon gynecology, it is stated that "fibroma is exceedingly rare . . . seems to be due to hypertrophy of the ovarian stroma." Among modern French writers on diseases of women, we note hastily Becquerel,⁴ who recognizes the existence of fibrous growths, but confounds them with "fibrous cysts." Courty,⁵ who simply mentions them, and Demarquay⁶ who is silent. Nonat⁷ remarks "L'histoire de ces sortes de lésions est entourée d'obscurité," Gallez⁸ merely hints at the formation of cysts in solid fibrous tumors of the ovary. Sinéty,⁹ the latest French authority, devotes but little space to the subject, but suggests that the growths are less rare than is supposed, and are probably often overlooked during life. The pathologists are more satisfactory in their statements. Cruveillier¹⁰ does not seem to regard the condition as a very uncommon one, while Cornil and Ranvier¹¹ allude to the occurrence of ovarian fibroids and their structure.¹² The Germans, with their characteristic thoroughness, treat the subject at greater length. Aside from the carefully reported

¹ Dis. of the Ovaries, p. 49.

² Knowsley Thornton (Trans. Lond. Path. Soc., Vol. xxix., p. 169) thinks it remarkable that he has only seen three solid ovarian tumors in 500 cases, "considering the changes, which take place in the stroma from youth to age."

³ Dis. of Women, 1882, p. 282, seq.

⁴ Maladies de l'Utérus. Tome ii., p. 266.

⁵ Mal. de l'Utérus, p. 813-939.

⁶ Traité Clin. des Mal. de l'Utérus, p. 280.

⁷ Mal. de l'Utérus, p. 889.

⁸ Hist. des Kystes de l'Ovaire, p. 40.

⁹ Manuel Prat. de Gynécologie, p. 629.

¹⁰ Traité d'Anat. Path., p. 702.

¹¹ Path. Hist.

¹² Boinet (Mal. des Ovaires) describes "Tumeurs Fibreuses," but obscurely.

cases by Leopold and others,¹ to which subsequent reference will be made, we find in Schroeder² a short but clear account of these tumors; Olshausen³ describes them and mentions several cases. Among the treatises on pathological anatomy, Virchow's⁴ work, already alluded to, furnishes us with considerable information. He notes also the interesting fact that this condition of the ovary has been seen in various domestic animals, as well in the human female, though in no case has he met with these fibrous bodies of any great size. Rokitsansky⁵ speaks of "the anomalous production of fibrous tissue" in the ovary, but does not appear to recognize such tumors as form the subject of this paper, since his variety are "rarely larger than a pea."

Rindfleisch⁶ describes a "hypertrophia notha ovariorum." Klebs⁷ mentions sarcomata of the ovary, which, from the description, do not seem to differ from fibromata. He has some peculiar ideas regarding the origin of these bodies. Klob⁸ is sceptical as to fibroids originating elsewhere than in the uterus, and thinks that, even where they seem to arise from the adnexa, a pedicle will be found attached to the fundus. Scanzoni⁹ has seen but four cases, Beigel¹⁰ cites three, and comments on their rarity. Gusserow¹¹ says nothing of ovarian fibromata.¹²

Among American writers we note of course Atlee¹³ and Peaslee,¹⁴ the former of whom thinks that "it is *exceedingly rare* (his own italics) to meet with a *hard fibrous tumor of the ovary*," and "when a tumor possessing the usual characteristics of a fibroid—being hard, solid, non-fluctuating—is found in the abdominal cavity, we may, as a general rule, decide it to be uterine." "Fibroids of the ovarian stroma are *very rare* (Peaslee¹⁵), and do not often exceed the size of a goose-egg."

¹ Archiv für Gyn.

² Weibl. Geschlechtsorgane, last ed., p. 411.

³ Ovarien, p. 415, etc.

⁴ Geschwülste, Art. Fibromata.

⁵ Path. Anat., vol. ii., Syd. Trans., p. 252.

⁶ Path. Gewebelehre u. Anat., p. 464.

⁷ Handbuch der Path. Anat., Tome ii., p. 822 and 829.

⁸ Path. Anat. Female Sex. Organs, Trans., p. 163, 161.

⁹ Weibl. Sexualorgane (French trans.), p. 356.

¹⁰ Krankheiten des weibl. Geschlechts, p. 444.

¹¹ Neubildungen des Uterus. Billroth's Allgem. u. Spec. Chirurgie.

¹² Diag. der Eierstockstumoren. Volkmann's Clin. Vorträge; no remark on fibromata.

¹³ Ovarian Tumors, p. 262.

¹⁴ Ovarian Tumors.

¹⁵ Ovarian Tumors, p. 25.

This author reports only two cases. Bedford¹ is silent with regard to the subject. Churchill² simply says that "fibromata of the ovary are identical with those of the uterus." No cause is known for them, he says. Goodell's³ experience is summed up in the clinical report already alluded to. Sims⁴ in his "Uterine Surgery" and clinical reports, seems to have met with no cases. Emmet⁵ has seen ovarian fibroids, but too small for operation; Thomas⁶ considers them as rare and calls attention to the distinction between true cysto-fibromata and fibroid cysts, quoting Farre as to the probable origin of the larger growths from the uterus. Dr. Thomas mentions a recent undoubted case of his own. This hasty review of the prevailing opinions of various authors with regard to the present subject will prepare us to better appreciate the difficulties which lie before us, in dealing with a theme hitherto so lightly touched upon.

The investigation naturally takes a twofold course, leading to (1), the consideration of fibromata of the ovary, (2), to the more difficult study of cyst-formation in these tumors.

It will be unnecessary to repeat the description of an ordinary fibrous⁷ growth, such as may be found in various regions of the body,⁸ and is so readily recognized by the surgeon. Macroscopically there is little danger of mistaking one (unless degeneration be far advanced), while the microscopical appearances are pictured in every modern text-book. But even though the main features of the class are so familiar, to say that all of these tumors are identical in their structure would be erroneous. One of the most interesting facts with regard to new formations, whether we accept the theory of Waldeyer,⁹ or that of Cohnheim,¹⁰ as to their origin, is the modification which they undergo in different situations¹¹—an effort (to use a modern scientific

¹ Dis. of Women, 1857.

² Dis. of Women.

³ Sup. AM. JOURN. OBSTET., Mch., 1882.

⁴ Vide also cases in AM. JOURN. OBSTET.

⁵ Gynecology, p. 775.

⁶ Dis. of Women, p. 675.

⁷ The words "fibroma," "fibroid," "fibrous growths," etc., are used synonymously, no such artificial distinction being made between them as is attempted by some surgical authors.

⁸ Vide cases of such tumors arising from different regions, as mentioned in Erichsen, last ed.

⁹ Ueber den Krebs.

¹⁰ Allgem. Pathologie.

¹¹ Thus Lücke (Lehre der Geschwülste, p. 133): "Die Form des Bindegewebes und etwaige accidentelle Elemente in den Fibromen hängen von der Art des Mutterbodens ab."

phrase) to adapt themselves to their environment. Thus each morbid growth within an organ seems to be stamped with some of the peculiar histological features of the adjacent normal tissue, so that we can almost imagine that we read at a glance the life-history. Even with the heterologous group¹ this is, to a certain extent, the case—how much more striking in the case of those bodies which appear to be simply hypertrophies of the original organ.

This is especially true as regards the simple tumors of the female genital organs,² where, in the writer's opinion, the embryonic theory of development is often unnecessary, however logical its deductions elsewhere. Who can study carefully the structure of a uterine fibroid, in a section made through the line of demarcation between normal and morbid tissue, and not be content to rest with the explanation of its direct origin, instead of imagining the existence of latent pre-natal elements?³ And in the ovarian fibroid, particularly, there is a close resemblance between the normal and pathological, so that at first glance the idea of an hypertrophy of the pre-existing stroma is suggested; the more one studies the subject the more definite becomes this idea. Here are the same peculiar spindle-cells, the identical "fibro-sarcomatous" structure, with which we are so familiar in the normal section, the "straffes, welliges Bindegewebe" of German writers.⁴

In the single specimen⁵ examined by the writer, the main fea-

¹ The writer has been struck with this in examining the "mixed" tumors of the testicle and parotid.

² Reference is made especially to fibromata and sarcomata. Klebs (as quoted by Emmet, op. cit., p. 518) gives a very satisfactory account of the origin of uterine fibroids. His view of their development certainly corresponds with the results of microscopical examination.

³ Cohnheim, loc. cit.

⁴ Leopold, "Die soliden Eierstocksgeschwülste," A. für Gyn., Bd. vi., p. 189, etc.

⁵ Not having been present at the operation, it is impossible to state definitely the relation of the tumor to the tube and broad ligament. These points are seldom reported clearly in the hospital records, so that it is necessary to judge somewhat by the general appearance of a specimen when received. It is certain that the growth occupied the site of the ovary, and had no connection with the uterus.

Much confusion exists in different works between fibrous and sarcomatous growths of the ovary, one or the other name being applied according to the prevailing tissue. By the term "fibro-sarcoma," the writer recognizes an attempt to reconcile diverse opinions as to the essential character of the growths under consideration. Vide Thomas, op. cit., p. 677.

tures were as follows: a smooth, hard, lobulated mass, somewhat oval in shape, the size of a pullet's egg, dimensions about 3x2 centimetres, weight 100-120 grammes. No separate capsule, pedicle apparently very short, no trace of tube or broad ligament. Nothing remaining to suggest portions of the normal ovary. In short, it corresponded closely in outward appearance with the usual descriptions of small ovarian fibromata. Section of the mass showed a firm, homogeneous structure, intermediate in density between that of the hard fibrous bodies growing from the lobule of the ear,¹ and the cut section of an ordinary uterine fibro-myoma. There was perhaps a closer interlacing of fibres in the ovarian growth, and the tissue itself was more delicate than was noted in specimens of the latter class. Aside from the common features of such connective tissue, the prevalence of spindle-cells was remarked, and on careful comparison with similar elements in the so-called "fibro-myomata," and fibro-cysts of the uterus, the writer was unable to satisfy himself in his own mind of the essential difference between the spindle-shaped bodies seen in both instances. By isolating separate fibres, it was indeed clear that the spindle-cells of the tumor under consideration were smaller and less defined than in the other specimens, that they bore a close resemblance to the characteristic elements of sarcoma, but, with the methods of staining employed,² repeated examinations have not convinced the writer of the value of the presence or absence of smooth muscle-fibre as an element in the differential diagnosis. Even Virchow,³ who is universally quoted as upholding this distinction, after saying that ovarian fibroids must not be compared with uterine, as much as they resemble each other, admits that "it is very difficult to distinguish undeveloped, or atrophied, smooth muscular fibres from connective-tissue cells. Sometimes we cannot tell the difference." To pursue this discussion intelligently, we shall be obliged to digress somewhat, and consider briefly the much-vexed question as to whether smooth muscle-fibres do, or do not, exist in the normal ovary. Opinions are pretty evenly divided, Koerberlé⁴

¹ On examination of one of these small, hard tumors, we are prepared to appreciate the fact that these are genuine fibromata, in the sense that they are essentially fibrous-tissue formations. Perhaps, in distinction from these, some authors would call other tumors of this class fibroids.

² The ordinary double staining with hematoxylin and eosin, the sections being examined in glycerin and oil of cloves.

³ Op. cit., p. 414, tome iii.

⁴ Nouveau Dict. de Méd. et Chirurgie, art. Ovaires, p. 469.

inclining to the affirmative, Rouget¹ being notably a supporter of this doctrine, Waldeyer² admitting it, though with limitations. In the latter's view the muscular fibres are limited to the "vascular zone;" he also speaks of them as "surrounding the large and medium-sized arteries, etc." Klebs³ and Aeby⁴ think that a large part of the ovarian stroma is composed of muscle-fibres. His⁵ is even more sweeping in his statements; Kölliker⁶ sides with Waldeyer. Jacobi⁷ thinks that the muscular fibre-cells are "rudimentary, superficial," and that "even these cannot be demonstrated, except upon the pregnant or recently parturient woman." Henle⁸ adopts the negative side of the question, Grohe⁹ admits that he has seen these cells in the ovaries of infants, less certainly in those of adults. Liégeois¹⁰ admits their existence in "la portion bulbeuse." Numerous other writers¹¹ either quote from the above, express the same views slightly modified, or carefully avoid committing themselves to either opinion,¹² the latter class being, in the present state of knowledge, by far the most judicious. Such being the position of authors in respect to the structure of the normal ovary, we can readily understand why there should be a lack of unanimity when the morbid growth is examined. Without quoting at length the evidence pro and contra, it may be stated briefly that the majority of observers have confirmed by observation (or copied) the ideas of Virchow, though a few, not wanting in authority, have ventured to differ from him.¹³ A large number take the position that true fibro-

¹ Vide elaborate article in Brown-Séguard's *Jour. de Phys.*, 1858, vol. i., p. 336, etc.

² Stricker's Handbook (Syd. trans.), art. Ovaries, vol. ii., p. 169.

³ Eierstock der Wirbelthiere. Virchow's Arch., Bd. xxviii.

⁴ Du Bois-Reymond's Arch. f. Anat. u. Phys.

⁵ Schultze's Arch. f. Micr. Anat., 1865, vol. i., p. 172.

⁶ Hist. Anat.

⁷ Question of Rest for Women, p. 90.

⁸ Anatomie, tome iii., p. 502.

⁹ Ueber den Bau des menschl. Eierstocks. Virch. Arch., vol. xxvi., p. 278.

¹⁰ Traité de Physiologie, chap. Ovaires," p. 227.

¹¹ Barnes, op. cit., p. 283.

¹² For example, Savage, Graily Hewitt, et al.; or, to mention works lately published in New York, and presumably up to date, Lusk and Satterthwaite. Lusk in his "Science and Art of Midwifery" omits all reference to the subject (p. 21). The latter copies the old ideas of Waldeyer without change (vide "Histology").

¹³ Koeberlé, loc. cit., who believes in presence of muscle fibres in normal ovary, says, "Les myofibromes des ovaires me paraissent très-problema-

myomata are found occupying the site of the ovary, but that in every case where careful examination reveals the presence of muscular fibres, the tumor will be found to have originated from the uterine tissue. We shall pursue the discussion no farther. The writer's views have already been stated, regarding the structure of the fibrous growth, and he prefers to preserve a similar attitude with respect to the normal stroma. Until some more certain methods of examination are discovered than either the treating of fresh specimens with acetic acid, or the staining of hardened sections, it is difficult to see how any one can express such a positive opinion as Noeggerath,¹ or how the presence of a few doubtful fibres can suffice to establish the origin of a pelvic growth.² To sum up the results of the study of our specimen—it presents the ordinary connective-tissue basis of the class to which it belongs, showing, however, a higher grade of development³ than is possessed by similar tumors elsewhere in the body, as denoted by the prevalence of cellular elements, so that in another locality it might have been called a sarcoma, but, observing its close resemblance to the normal organ, we recognize it as a true fibroma, stamped with the peculiar marks of its origin. And, lastly, we note on comparison with leio-myomata of the uterus, a difference, more in the gross than in the minute anatomy, a finer, denser arrangement of fibres, less vascularity, and the absence of a capsule; the prevailing cellular elements

tiques," an apparent inconsistency. Leopold (loc. cit.) follows Virchow, also Lücke ("Lehre von den Geschwülsten," p. 131); vide also Todd's Cyc. of Anat., art. Ovaries. Most of the gynecologists support the view of the non-occurrence of fibres (Spencer Wells, Tait); Rindfleisch and Billroth go so far as to deny that there are even found such smooth muscle fibres in uterine fibroids. Wilks (Barnes' "Diseases of Women," p. 283), and Wilson Fox assert the valueless use of this test in differential diagnosis, opposing Bristowe and Hutchinson. Sangalli (Storia dei Tumori) quotes an undoubted case of pure fibro-myoma of the ovary.

¹ AMERICAN JOURNAL OF OBSTETRICS, January, 1880, paper on a "New Method of Formation of Ovarian Cysts." He seems to think that most of the spindle cells found on section are smooth muscle-fibres. He has examined many ovaries wherein these fibres were "confined entirely to the vessel wall."

² Klob (as quoted by Leopold) adheres to a modified opinion, thinking that ovarian fibroids differ from uterine in the *predominance* of connective tissue over muscle fibres. This is a very suggestive thought, and better than a positive negation without sufficient evidence.

³ Instead of saying that this tumor possessed a "higher grade of development," it might be better to say that it showed a greater tendency to pass into another type.

in the two cases appearing to differ in size and distinctness of outline, rather than in distribution or arrangement.¹ A word as to the origin of ovarian fibroids before passing to the second division of our subject.

The writer's views have been hinted at in the introduction. The current ideas respecting the etiology of morbid growths are sufficiently familiar.² Cohnheim's theory is a very attractive one, but even he does not argue quite so confidently with regard to the origin of fibromata, as in the case of other tumors. The definition of tumor which he lays down in the beginning, "eine Abweichung der Gewebezunahme vom morphologisch-anatomischen Typus der Localität," hampers him when he comes to consider a class whose structure bears so close a resemblance to the "Typus der Localität." At least, he pleads, we can grant that his theory holds in cases of "multiple fibromata."³ If he had looked to the ovary for confirmation, we venture to affirm that the result would have been disappointing. Nor need we, in our case, expect to discover a process of development from pre-existing normal tissue. Virchow has indeed described the fibrous growths as commencing at the periphery of the organ, and gradually absorbing the stroma, until either only a small portion of the normal tissue is left intact, or its site is occupied by the new formation.⁴ Lücke⁵ (also Cohnheim⁶) refers to a central and peripheral mode of growth, the latter at the expense of the normal tissue. Irritative processes have been noticed at the supposed line of demarcation,⁷ but never a defi-

¹ Comp. Lücke (loc. cit.), p. 132. "In pure fibromata we find, as cell-elements, only the well-known connective-tissue nuclei . . . yet the more highly developed forms of connective-tissue cells (especially spindle and round) may be seen, and, by an increase of the cellular elements over the fibres, we get the transition forms—die so-genannten Fibrosarcomata."

² Vide Cohnheim, *Allg. Path.*, vol. i., p. 630-638. He here expands his theory of embryonic origin. Waldeyer (Ueber den Krebs, *Volk. Klin. Vorträge*, No. 33, p. 176) formulates his idea of growth from normal epithelium. Lücke (op. cit., p. 134), origin of fibromata from local irritation; vide also Virchow (Tumors), introductory chapter. Billroth, *Surg. Path.*, chapter on "Tumors."

³ Op. cit., p. 640.

⁴ Similar opinion expressed by Sinéty, op. cit., p. 629.

⁵ Op. cit.

⁶ Op. cit., p. 671. "So muss nothwendig überall da, wo die Geschwulstmasse Platz greift, normales Gewebe verloren gehen."

⁷ Virchow, et al. Duncan (*Lectures on Dis. of Women*) would refer "hy-

nite boundary between the normal and pathological. An attempt has been made to fix the exact locality in the ovary whence arose the first beginnings of the tumor. The writer has been able to collect only four authentic cases of fibrous bodies arising from the *corpus luteum*,¹ so that the statement of Klebs² is rather surprising: that "a *great part* of the ovarian fibromata" originate thus. Of more importance is the study of the "corpora fibrosa," so long recognized,³ but not thoroughly investigated till recently.⁴ They have been studied in connection with the present subject, but the results obtained were mostly negative. The writer agrees with the conclusions reached in Patenko's article, that these bodies are simply local scleroses, having their origin in the walls of the follicles, that they are always circumscribed, and that, though by the union of adjacent corpora fibrosa, patches of some size may be formed, they do not themselves ever form appreciable tumors. It is a fact that, in the stroma surrounding them, there is often noticed an increase in the number of cell-elements. Whether we have here evidences of a local irritation, leading to general hyperplasia or not, we cannot say. At present, these bodies are to be regarded as curiosities in an organ which abounds in inexplicable things.⁵

per trophy" of the ovary to a pre-existing chronic ovaritis. There is a great leaning in this direction among gynecologists. As Emmet honestly confesses (and the writer has verified this at autopsies), the ovary is regarded clinically as the seat of many affections which are not found to be present after death.

¹ Rokitansky, two cases; Klob, one case. Jenks (AM. JOURN. OBST., vol. vi., p. 106) reported an undoubted case.

² Handbuch der path. Anat., tome ii., p. 829.

³ Virchow ("Geschwülste") says: "There may be a granular degeneration or cirrhosis in the ovary, . . . but this is only a chronic oöphoritis, and *not* a tumor." He refers these changes to the Graafian follicle, which observation is confirmed and expanded by Potenko. Perhaps Virchow meant the "corpora fibrosa."

⁴ Patenko: "Ueber die Entwicklung der Corp. Fibrosa in Ovarien." Virchow's Archiv, 84, p. 194 et seq. Birch-Hirschfeld (Lehrbuch der path. Anat., p. 1,100) speaks of the "hypertrophied cicatrices of Graafian follicles." He confuses the subject by stating as he does: "Häufiger enthalten die fibrösen Geschwülste zahlreiche Muskelfasern, so dass sie als Myome (!) zu bezeichnen sind."

⁵ In the sections of corp. fibrosa examined by the writer, the stroma in general seemed denser than usual. There were hemorrhages into the interstices of the tissue, as well as into the fibrous bodies themselves. In one section there was an immense number of yellow pigment-cells with large central nuclei. Spindle cells were abundant and unusually large, also numbers of round and branched connective-tissue cells, but nothing suggesting a general hyperplasia.

Like the hyaline metamorphoses, the local hemorrhages, large pigment-cells, and other anomalous appearances so frequently encountered here, we can merely guess at their pathological import. There remains only one other theory to account for the origin of fibromata of the ovary (and the present specimen in particular), and that is the most natural one in the world—an increase in the normal stroma. It was the explanation which first suggested itself to observers, and it is difficult to see how it can be improved upon.¹ Our tumor was proved to be homogeneous throughout, with nowhere any trace of follicular remains. There were no evidences of hemorrhages, no appearances suggestive of inflammatory processes. Compared with the normal sections, the only difference seemed to consist in the greater density of the tissue in the morbid specimen, combined with an increase in the number of spindle-cells. But it was the stroma, and that portion of the organ alone, which had its counterpart in the fibroma, if we except the firm, whitish layer of connective tissue at the periphery of the tumor, which recalled the *tunica albuginea*. If any of the original ovarian tissue had remained, it would have been impossible to differentiate between it and the new-formed material. It is surely logical to regard the present as a case of simple hyperplasia of the stroma, without resorting to the supposition that there was a preceding chronic ovaritis,² of which there is no evidence. This term

¹ Rindfleisch (op. cit., p. 464): "Hypertrophia notha ovariorum," defined as "hyperplasia of the stroma, so that the ovaries can enlarge to the size of the fist." Virchow speaks of these tumors as "hyperplastic growths which arise from a pre-existing fibro-muscular tissue by a progressive increase in that tissue." Leopold infers that they arise by "gradual hypertrophy of the whole ovary." Waldeyer (Archiv f. Gyn., vol. ii., p. 440) calls attention to an ovarian fibroma as looking just like the enlarged organ. Birch-Hirschfeld makes a distinction: "Während diffuse Hypertrophie des Ovarialstroma ziemlich oft vorkommt, werden fibromatöse Geschwülste dieses Organs relativ selten beobachtet." It is doubtful if this will hold good. "Fibroma of the stroma of the ovary," says Peaslee, "is histologically simply a diffuse proliferation of the connective tissue of that organ." (Ovarian Tumors, p. 24.) "A preponderance of the muscular tissue (*i. e.*, in uterine fibroids) is rare; in general, the formation of the muscular substance runs parallel with the vascular development, and the richer nutritive supply thus originating" (Klebs, loc. cit.).

² In employing the words "hyperplasia," "hypertrophy," the writer has in mind a passage in the introductory chapter of Flint's "Practice," last edition (*i. e.*, article on Hypertrophy, p. 41). "Two forms of hypertrophy have been distinguished, viz., *simple* or *true hypertrophy* and *numer-*

"ovaritis" is too often a mischievous one, employed by gynecologists to render still more obscure a supposed pathological condition. As regards the direct cause of these hyperplasias, the writer can offer no satisfactory explanation. Lücke,¹ of course, urges his peculiar ideas of local irritation. Race² seems to be an uncertain element. Age is not without influence, fibrous growths being the product of the youthful and active, not of the senile ovary.³ The influence of antecedent inflammation⁴ has been alluded to. That there is a chronic hyperplastic condition of the ovary, we have noted at autopsies, but whether it is a similar process to the one under consideration or not, or what its relation is to the occurrence of large fibrous tumors (some of which grow to the size of sixty to eighty pounds) we can only surmise. Knowing how frequently the organ is the seat of other morbid growths, it is surprising that the former variety are met with so rarely. That the large fibroids found in this region⁵ should result from a similar hyperplasia, we see no reason to doubt, less we believe that there may be two separate varieties. Undoubtedly some of these fibromata (such as the one examined) never reach any considerable size, the density of

ical hypertrophy or hyperplasia. It is not practicable to carry out this distinction, as the two forms of hypertrophy are frequently combined," or "areolar hyperplasia" of Duncan. For account of a very large tumor of ovary vide article by Spiegelberg, Schmidt's Jahrbuch, 1867; also Van Buren's cases, loc. cit.

¹ Op. cit., p. 134.

² In reports of between thirty-five and forty cases, no stress is laid upon the fact of the patient being of the African race.

³ Idem, "Im Ganzen kann man sagen, dass das höhere Alter für die Entwicklung rein bindegewebiger Geschwülste nicht disponirt." Average age, 20 to 40. "They (ovarian fibroids) often occur in *young* women, but are uncommon, except when they form a portion of a cystic tumor."—Lloyd Roberts (Brit. Med. Journ., vol. i., 1872). Rather a contradictory statement.

⁴ Ensues most frequently as a consequence of oöphoritis, and both ovaries are generally affected, but remain of small size" (Peaslee). "The most common diseases of the ovary are due to incomplete or perverted function" (Tait-Hastings Prize Essay, on the "Ovaries," Br. Med. Journ., vol. i., 1874).

⁵ The writer accepts the view that the *large*, as well as the *small* tumors of this class may originate *in the ovary*, the contrary being held by most authors. Many authors utterly reject the theory that fibrous tumors of large size arise primarily from the ovary. If such a body is found entirely separate from the uterus, with its own pedicle, vascular supply, etc., what more can be offered to prove that it is of strictly ovarian origin? If it grew from the uterus, there would certainly be some change in that organ itself, whereas it is often found perfectly normal.

the tissue and poor vascular supply pointing to a slow and limited growth; while others, of softer texture and richer in blood-vessels,¹ grow rapidly, and equal in dimensions the largest uterine tumors. But there are other influences which account for the difference of development in fibroids, which have, as the writer believes, a similar origin. These we shall now consider. The study of the changes which take place in the interior of fibroid tumors is no new one. Long before Virchow described them, Astruc,² in his quaint old work, had given a remarkably intelligent account of "Incised Tumors of the Uterus." In fact, the macroscopic appearances of these growths are so evident that no surgeon could have failed, even on a first examination, to inquire as to their cause. In an age when speculation was rife, there was no lack of theories as to the origin of the curious cavities so often found in new formations, and even now, with all the light of modern research, we have not yet been able entirely to discard those same ideas of the past; in fact, experience has shown that the old observers made some very shrewd guesses in their day. "Niemals ein Neoplasma sich spontan zurückbildet," says a writer on general pathology,³ a statement which can hardly be made so positively, since there are always exceptional cases which never come to an autopsy. The life-history of tumors is a very varied one, for, while some preserve throughout the same characteristics that marked their youth, others hasten on to a premature decay, losing all of the features peculiar to them in the beginning. Moreover, each class differs in the kind and degree of degenerative changes which it may undergo. Of all neoplastic growths, we shall find none subject to a greater variety of retrograde processes than the fibrous. Every one who has examined carefully a large number of fibroids, has remarked the fact that there are few in which, either macroscopically or on minute inspection, such changes cannot be found. Though we are to consider only a single form of degeneration, the cystic, we shall find it necessary to refer to nearly all of the other kinds, since they seldom exist independently. Nor shall we meet with evidences of degeneration alone, since other appearances are often

¹ All writers concur in this. The larger size of the fibro-cysts, as compared with solid fibromata, is a matter of constant observation.

² Loc. cit., chapter xiii., p. 232.

³ Cohnheim, op. cit., p. 658. He also speaks here of "die physiologische Widerstandsfähigkeit" of tumors.

present, which cannot strictly be classed with the former. We shall be able, in this connection, to study fibro-cysts of the uterus, as well as those of the ovary, since their mode of origin and structure are identical.

Changes in fibrous tumors have been variously spoken of as "hemorrhagic," "lymphangiectatic,"¹ "thrombotic," "necrotic," or "gangrenous,"² "fatty degenerative," "colloid,"³ "myxomatous,"⁴ "mucoid,"⁵ "schleimige Erweichung,"⁶ "ödematöse Erweichung."⁷ The expressions "general edema," "sarcomatous,"⁸ "cystic," "cystic softening,"⁹ and other terms,¹⁰ have been applied from real or fancied resemblances. All of the above transformations have been urged to account for the formation of cysts, yet the common error has been that the presence of any one of the processes should be thought sufficient; we shall see that the change is by no means a simple one. It would appear at first sight as if the ground had been pretty thoroughly covered, but the great majority of observers have contented themselves with hasty examinations, or simply copied the theories of others. It will be advisable to sift out the original material,¹¹ and to compare our results with it, as we proceed in the study.

Some time before he became acquainted with the subject

¹ In this connection, we also meet with the expression "phlebectatic," "ectasie," "angiomatous," "lymphatic edema," "lacteal cyst," etc.

² "Granular degeneration."

³ Id., Leopold et al.

⁴ Klebs, Heer (Inaugural Dis., Zürich).

⁵ Name suggested by Dr. Welch; have not seen it elsewhere.

⁶ Lücke, op. cit.

⁷ Heer and many others, as Schmidt (Schmidt's Jahrbücher, 1866, p. 129).

⁸ Heer probably had in mind the passage in Lücke already quoted, where an increased growth of spindle-cells is said to make a "fibro-sarcomatous" type.

⁹ "Pseudocystic"—Schmidt.

¹⁰ "Ossification," "calcification," "cartilaginous transformation," "cancerous (?) degeneration" will not concern us. A discussion as to whether the latter process ever occurs in fibroids would be irrelevant. Cruveilhier says, "*Non, mille fois, non!*" Others think differently. Schmidt uses the terms "gallertartig," "fibro-colloid."

¹¹ The writer has been unable to find anything new on the subject since the early investigations of Virchow and Cruveilhier. Others assuming at the start the truth of these great teachers' statements, have never sought to disprove, but only to elaborate them.

The matter for surprise is that so many have been able to see just what the original investigators described.

through the literature, the writer had observed the peculiar spots of softening, seen on section of fibroid tumors, known to foreign microscopists as the "geodes" of Cruveilhier—in this country sometimes spoken of as "edematous patches." He noted, as many others had previously done, their apparently gelatinous or colloid consistency on gross inspection, suggesting a similar material found in the umbilical cord. On a hasty microscopic examination, the resemblance to the so-called "mucoid" tissue seemed close enough to awaken the thought, perhaps here is a mysterious mucoid transformation occurring in the very midst of a firm, dense fibrous tissue; how or why, it is impossible to say, since there exists no analogous condition in the normal tissues. Other sections through these semi-solid masses suggested myxomatous changes, such as the writer had recently encountered in examining composite tumors of the breast, especially those of the sarcomatous and adenomatous type. But this idea was equally unsatisfactory, since there was nothing to account for the appearance of these small and scattered islets, surrounded on all sides by the unchanged fibrous basis of the tumor. Although "geodes" were found as large as a small walnut (but still exhibiting the same features as the most minute ones), it was difficult to persuade one's self that any intimate relation could exist between these and the immense cavities which procure for these tumors the name "fibro-cysts," or, as we prefer to call them, "cysto-fibromata."¹ Previous careful study of the origin and development of true ovarian cystomata had prepared the author to appreciate the difference between these forms and those of uterine origin. But the adeno-cystomata bear in their interior clear traces of the source from which they spring. Not so with the large cysts, secondary to fibrous enlargement. Any inferences as to their original growth, drawn from an examination of the walls of the latter, would be most incomplete—in fact, we should argue a process of decay, rather than one of growth.

The writer would have it distinctly understood that he does not consider the pseudo-cysts,² often found in the large tumors,

¹ The term "fibro-cyst" might be confounded with a totally different expression, *i. e.*, "*fibrous cyst*." The name "cysto-fibroma" (rarely used in literature), like "fibroma" itself, is self-defining—a fibroma containing one or more cysts.

² Interesting in this connection was a specimen obtained a few days since from Dr. Thomas, consisting of the uterus and both ovaries removed

resulting from extensive hemorrhages, fatty degeneration, or, literally, necrotic softening,¹ since they are not cysts at all. However, though these processes are not regarded as the original agents in true cyst-formation, their aid will be invoked to account for the later changes which may appear.

The only veritable cysto-fibroma of the ovary which the writer has observed was a companion to the fibroma already described, springing from the opposite ovary, and removed at the same operation. It was as large as a fetal head, possessed no capsule, and sustained to the Fallopian tube and broad ligament the usual relation seen in solid ovarian growths, that is, grew free from them.² In consistence, as well as shape, it offered a marked contrast to the smaller tumor, being round, non-lobulated, and slightly doughy on palpation. On section, the contrast was heightened, for instead of a firm, dry, glistening surface, there appeared a soft, succulent tissue, from which fluid could be readily squeezed. In the centre of the mass was a cyst the size of an orange, filled with a thin sanio-serous fluid, spontaneously coagulable. The wall of the cavity was smooth and regular, showing neither hemorrhagic nor necrosed spots; the tissue immediately adjacent was more condensed³ than elsewhere throughout the tumor. Patches resembling "geodes" were few. The fresh fluid yielded on microscopic examination fibrin and blood-corpuscles, but no other morphological elements; neither was any epithelium observed in the scrapings from the walls. The usual chemical tests were valueless on account of the addition of blood to the original contents of the cyst. The tumor being hardened and sections made in the usual manner, it was found to be a fibroma closely resembling the former one in minute

by laparotomy. Growing from the former was a large mural fibroid (size of man's head), in the interior of which was a large cavity filled with sanious fluid, and a loose, hard mass the size of goose-egg. Section of the latter showed only a limited degree of degeneration, the fibrous tissue being completely preserved. Section through the smooth wall of the cavity gave like results. Here was an interesting example of necrotic change, so gradual that the density of the affected tissue was not affected. Yet no one would call such a cavity a "cyst."

¹ In a few cases (Klebs et al.), a real pus-cavity has been found in the centre of a fibroid, but not limited, and without a pyogenic membrane.

² Leopold, loc. cit.

³ This expression is used to denote fibrous tissue in which the fibres are closely and firmly packed together. It seems especially appropriate as applied to the appearances seen at the edges of large cysts.

structure¹ (and hence like the normal stroma), though with this difference—the fibres were loosely interlaced, in places widely separated, so as to leave interstitial spaces, which were occasionally packed with lymphoid cells. This tumor was also much more vascular than the other, showing the presence, not only of dilated vessels, but of many blood-extravasations. No degenerative changes, strictly speaking, were to be found. The general aspect of all the sections suggested the existence of a wide-spread edema, which had softened and separated the fibres, rendering the resemblance of the tissue to that of a myxoma very complete. With a higher power ($\frac{1}{5}$ obj.), the appearances in the neighborhood of the cyst were as follows: As the observer approached its wall, the loose tissue became somewhat denser in structure, the spindle-cells no more numerous, but in closer proximity to one another, until at the edge of the cavity they were arranged in parallel rows, and placed end for end, especially the most internal layer. It was easy to imagine how a row of these swollen cells, placed in regular order, could be mistaken on hasty examination for the remains of an endothelial lining, when their focus is a little different from that of the remainder of the field. Groups of round connective-tissue cells were not wanting; those of the branched variety were not so well defined. But of especial interest was the presence of collections of blood-corpuscles adjacent to the cyst, some of which were evidently derived from neighboring vessels, while the source of others could not be found. All through the tissue, little groups of three or four blood-cells might be seen, and the more carefully the sections were scrutinized, the more it appeared that this condition was a general one throughout the specimen, though most noticeable at the

¹ The arrangement of fibres and spindle-cells reminded the writer of a very interesting "recurrent fibroid" of the breast which he had an opportunity of studying.

Since writing this paragraph, the following passage from Klebs was observed: "Between the coarse muscular bundles, as well as between these and the connective-tissue sheaths of the vessels, may be observed everywhere narrow, slit-like gaps, which contain white blood-corpuscles, and are surrounded by a fine boundary line, within which here and there lie nuclei. A cavernous structure thus originates, which is not found in the normal (uterine) tissue, and it is very probable that these cavities are to be regarded as *lymph-spaces* in which the blood-vessels and muscular bundles are suspended, as it were, by fine bands of connective tissue." (Handbuch der Path. Anat., 4th edition.)

locality before-mentioned. Within the cyst itself (and this is an important point), in spite of its probable age,¹ and adherent to its wall, was a fine network of coagulated fibrin, such as we shall so often encounter in our subsequent studies, holding in its meshes a few scattered corpuscles, which seemed to have come from one of the interstitial hemorrhages. After repeated searching for endothelial cells, under the most favorable circumstances, the writer came to the positive conclusion that there were none present, and probably never had been. And yet this was a cyst of small size, in which an endothelial lining ought certainly to have been present, if (as some claim²) it is found in others so much older and larger. But, on examining more carefully the solid portion of the fibroma, the observer came upon objects which had escaped him before—changes in the blood and lymph channels which denoted a serious disturbance of their functions.

Around the larger blood-vessels the spindle cells were arranged, as usual, concentrically and in firm, close order, but the intima was the seat of hyaline degeneration, which narrowed the lumen in some cases to a marked degree.³ The media, and even the adventitia, were also affected by the change. There was no doubt as to the real nature of the metamorphosis, since, aside from the characteristic staining⁴ of the hyaline material, it could not be distinguished from undoubted examples of the same, which the writer has observed elsewhere. Wiegner's plates⁵ (Virch. *Archiv*, 78) figure like appearances in the vessels supplying lymph-glands. There were other abnormalities in the arteries. Many were largely dilated and choked with blood-corpuscles, while there were all degrees of extravasation, notably in one case, a hemorrhage *into the adventitia*. In other sections the

¹ "Age," as compared with the "geodes."

² Leopold (Arch. f. Gyn., 1880), in describing a tumor, states that the larger (!) the cysts, the more apparent the endothelial lining (p. 408).

Vide also case cited by Dr. H. J. Garrigues in JOURN. OF OBSTET. for April, 1882, "On Diagnosis of Ovarian Cysts, etc."

³ So that the general endarteritis of chronic Bright's was suggested.

⁴ Vide Noeggerath (loc. cit.). The sections were compared with his original specimens and corresponded closely.

⁵ Wiegner ("Hyaline Entartungen in den Lymphdrüsen." Virch. Arch., 78) describes change as occurring mostly in the smaller arteries. The lumen may entirely disappear. Also Arndt ("Hy. Entart. in Gehirnarterien." id. op., 49). In his cases the adventitia was not usually affected. Billroth mentions cases in which the change began in the adventitia.

vessel-walls had disappeared, whether as a result of long-continued pressure from within, or actual degenerative change, it was impossible to say, though the former supposition seemed more probable. Again, other lumina contained leucocytes, which were seen in groups within the cavity, between the layers of the adventitia, and scattered throughout the fibrous tissue surrounding the vessel.

The circulation through the lymphatic system seemed also to have been interfered with, judging by collections of small round cells scattered throughout the field. These at first appeared to be accidental, but against this view was their occurrence in regular isolated groups within well-defined spaces.¹ The condition was so like that in the blood-vessels that the natural inference was—this is a lymph-stasis, indeed it could be nothing else. No lining, endothelial or other, was seen at the borders of any of these cavities, nor could any lymph-vessel be recognized in their proximity (such as are confidently described by the later observers). Indeed, these collections of leucocytes were, as before stated, strictly circumscribed, and therefore confined within lymph-spaces, and not dilated lymph-vessels.

(To be concluded in next number.)

A CONTRIBUTION TO GYNECOLOGICAL SURGERY.

BY

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WHILE making no pretensions to gynecology as a specialty, the author of this paper has always felt the deepest interest in that department of medical science, which, in the past decade, has made more rapid strides than any of the collateral branches, chemistry not excepted, and, therefore, was glad to avail himself of those cases which came under his own observation, and of those sent to him by professional friends.

A simple ovarian cystoma, in these days of advanced gynecology, presents but few points of interest, but, in the more complicated cases of abdominal tumors, there is always some-

¹ Comp. Klebs' description, previously cited.

thing to be learned, and it is a remarkable fact that, even with the most extended experience, the operator may find, after the abdominal cavity has been opened, conditions and appearances unknown to him before, and points of interest of which he had not dreamed.

A perusal of the current gynecological literature of the past few years amply demonstrates the truth of this assertion.

In some instances, the diagnosis of an ovarian tumor may be almost made out by a glance at the *facies ovariana* and the conical abdomen; in other cases, the aspirator, percussion, palpation, and the microscope are required, and again in others, perplexing doubts may arise in the minds of the most experienced, even with the aid of all the subjective and objective symptoms, and with all the light that microscopy and chemistry can bring to bear upon the diagnosis.

It is not within the scope of a paper, intended to be mainly clinical in its character, to enter upon these topics, but the author would state that, for a number of years, the points that have appeared to be most reliable in diagnosis were the shape of the abdomen, the sounds revealed by percussion, the sensations accorded by palpation, the color and density (stickiness) of the fluids drawn by the aspirator, and the presence of Drysdale's corpuscles. Of Bennet's engorged corpuscles and the transition of nuclei to Drysdale's corpuscles, and other appearances so ably described in the erudite and carefully prepared papers of Dr. Garrigues, the writer has had little opportunity of judging, but it cannot be doubted that the *skilled* microscopist will always be able to furnish data from which reliable diagnostic conclusions can be drawn, and to such a *specialist*, if possible, the specimen should always be referred.

CASE I.—*Composite tumor of the ovary. Twelve tapplings. Over 559 pounds of fluid withdrawn. Pregnancy. Instrumental delivery. Transfusion. Removal of tumor weighing seventy pounds. Death.*

Mrs. —, aged about forty years, in December, 1865, was afflicted with severe vomiting, which for several months resisted medication, but being finally controlled, she noticed an enlargement of the abdomen, for which she consulted a physician, who declared her to be pregnant, but who subsequently altered his opinion, and diagnosed a fibroma of the left ovary. Further examination, with a rapid increase in girth, revealed the presence of fluid, which was removed by tapping to the amount of 29 lbs. She soon after became pregnant, and after a tedious labor was

with difficulty delivered with forceps. Three days thereafter (in July, 1867), the abdomen measuring fifty-four inches, 39 lbs. of fluid were removed. In the following October, 37 lbs.; and in December, 42 lbs. were drawn. The quantity of albumen in these fluids varied at each tapping. In the following May (1868), 47 lbs. were taken, and after the complete removal of the fluid, a solid substance, resembling a fetus in size and position at full term, was distinctly felt in the left hypogastric region. Some of the physicians who saw her at this period distinctly *heard* the fetal heart-sounds, and a second pregnancy was pronounced certain. In August of the same year, 32 lbs. of fluid were withdrawn, and in the beginning of the next December, her physician was sent for in haste, with a message that the "waters had broken." He hastened to the bedside, and found her, as he says, "with pains entirely similar to those of labor, beginning at intervals in the small of the back, and extending to the uterus." Fluid mixed with blood came in gushes, and the os dilated to the size of a ten-cent piece. These symptoms continued for three hours, and disappeared. In the month of March, 54 lbs. of water were withdrawn, and in June, 1869, a similar quantity. In Aug., 59 lbs.; in September, 46 lbs., and in November, 56 lbs. At this time, I was called in consultation and the condition of extreme emaciation and prostration in which I found her can be easily imagined. Death appeared imminent, and I therefore transfused her on November 15th, 1869. An $\frac{3}{4}$ iss. of defibrinated blood from her husband's arm was thrown into the median cephalic vein at short intervals and repeated five times. The result was remarkable; her strength returned in a measure, and I performed ovariectomy upon her as a last resort. The adhesions to the intestines and omentum were dense and very numerous. The tumor weighed in all 70 lbs., 50 of which were fluid and 20 being solid masses. The pedicle was ligated with strong silk, divided with the *écraseur* and "pocketed." She died on the evening of the following day from internal hemorrhage.

This was my first case of ovariectomy; it was performed in St. Louis early in January, 1870, before the publication of either Peaslee, Atlee, or Wells, when the newer points of the operation were as yet *sub judice*, when Drysdale's corpuscles were, at least to me, unknown, and when "Listerism," in its completeness, was just beginning to attract attention.

I never have had, excepting in the case of Freund's extirpation of the uterus, hereafter to be mentioned, such a difficult operation to perform, or one which gave me such great anxiety.

CASE II.—*Oligocystic tumor of the right ovary: the whole anterior surface adherent. Ovariectomy. Recovery.*

The following case presents two points of interest: first, in

the grave nature of the pathological adhesions¹ *anteriorly*, with the absence of any connections on the posterior surface of tumor, and second, in that the case may be classed among the first which were operated upon by the antiseptic method, it antedating Dr. Sims' case, in which he claims priority of this method² by several months.

Mrs. —, aged 33, two months before the delivery of her last child, was seized with excruciating pains in the left ovarian region. These continued after delivery for nine years, when she noticed a tumor growing rapidly in the left iliac region. In March, 1876, these pains returned with such violence, and were accompanied with such excessive tenderness of the abdomen that she was obliged to sit in a doubled-up position for over three weeks. She entered the Hospital May 16th, 1876, and on the 24th of the same month I performed antiseptic ovariectomy upon her. Every precaution was used, all the blood-vessels were tied with Lister's antiseptic animal ligatures, as well as the pedicle, which was severed with the *écraseur*. Upon opening the abdomen, the whole anterior wall of the sac was adherent to the parietal peritoneum, but so soon as these were detached, the sac was readily drawn out. She made an uninterrupted and rapid recovery.

CASE III.—*Ovarian Polycyst; many adhesions. Forty pounds of fluid. Six tappings. Ovariectomy. Cure.*

Mrs. —, aged 59 years, native of England, entered the Hospital March 25th, 1878. Was married at the age of nineteen, has had ten children and three miscarriages, and was forty-seven years old at the birth of her last child. Climacteric six years since. Three years ago was thrown down a hill, another woman falling upon her. Shortly after this, there was a perceptible increase in the size of the abdomen, which she thought was fat. Finally, a physician was sent for, who diagnosed ascites, and tapped her, three pailfuls of water being removed. Eleven months after, a profuse sanguineous discharge escaped from the vagina, containing shreds of membrane and decomposed clots. She then came under my care, and during five months was tapped as many times, three bucketfuls of fluid being removed at each operation. Her abdomen before the tappings would measure about fifty-three inches. At the time of operation, the abdominal circumference at umbilicus was $46\frac{1}{2}$ inches, right half of circumference, $23\frac{1}{2}$ inches, and the left half $22\frac{1}{2}$.

The operation was performed on the 27th of March, at the Ward's Island Hospital. She was placed in a large room with a partition only five feet high to separate her from a ward contain-

¹ Peaslee makes a marked difference between merely physiological and the true pathological adhesions occurring in ovarian cystoma. *Vide* Ovarian Tumors, p. 377.

² Medical Record, Dec. 9th, 1876, p. 793.

ing thirty beds. I mention this fact to show that, with proper antiseptic precautions, ovariectomy may be successful, even if in close proximity to ulcers and wounds. All the blood-vessels were secured by carbolized catgut, and the pedicle also, which was severed with the *écraseur*. A glass drainage-tube was used, kept corked, and cleansed under a stream of spray. She was out of bed on the 14th day, and left the Hospital in three weeks.

CASE IV.—*Hysterotomy and ovariectomy. Death on the twelfth day from tetanus.*

Mrs. —, aged thirty-eight years. Always had been a hard-working woman, and had enjoyed good health until about two years before I saw her, when, after a day of more than ordinary labor, she was seized with a severe pain in the right ovarian region, which extended into the thigh. Shortly after, the abdomen began to enlarge, and when I saw her, she measured at the umbilicus forty-seven inches, with the most decidedly conical abdomen I have seen before or since. Her history was one of prolonged diffuse peritonitis. She was in very indigent circumstances, and resided in Brooklyn, and refused—as such persons frequently do—to go to any hospital. I therefore performed the operation at her house on October 19th, 1872. The adhesions were everywhere—omental, hepatic, intestinal, and splenic, and very dense. After separating as many as I could, and tying the vessels (and there were many of them), I lifted the entire mass out of the abdomen, put the chain of the *écraseur* around the cervix as it enters the vagina just above Douglas' pouch, and severed the entire mass. The left ovary and tube were not implicated. The shock was comparatively slight. There was no bleeding, and no septicemia. She rallied in a remarkable manner. On the third day, her temperature stood 101°, and her pulse to 110 beats. Her nurse, however, was not reliable, and on the twelfth day (just about as I was beginning to think that all danger was passing), she fell asleep in the night, the fire went out, the weather became excessively cold, and when I saw the patient the next day, she had had a severe chill, her temperature was 105°, her pulse 130, with that peculiar stiffness about the nape of the neck that notifies the approach of tetanus; it came. She died the next day. I may venture to express the opinion, that if this patient had been properly cared for by experienced nurses, and constantly under the eye of a physician, she would have recovered.

CASE V.—*Enormous dermoid cysts. Tufts of hair, lime, teeth, and bones in the sacs. Death on the third day.*

The following most interesting case demands more space than can be allowed to it in an article of this character.

Mrs. —, aged twenty-seven. Three years before her admission to the hospital, was delivered with forceps of a male child. Eight months afterward, her abdomen began to enlarge, attended with metrorrhagia and dysmenorrhea. Her uterus also increased

in size, giving rise to the supposition that subinvolution with congestive menorrhagia, or, perhaps, of myo-fibroma, might exist. The former diagnosis was actually given by a distinguished gynecological professor, who found the longitudinal diameter of the womb five inches. Ergot and belladonna were prescribed. When I saw her, the abdomen measured fifty-three inches in circumference; was dull on percussion anteriorly; fluctuation was distinct, with a hard, movable tumor in the left hypogastric region. Upon aspiration, the fluid showed large quantities of albumen by heat and acetic acid; ovarian globules, inflammation corpuscles, pus-globules, cholesterin, and fat-granules. Ovariotomy. Upon introducing the trocar into the sac, the fluid ran freely at first, gradually became colloid, and finally ceased. Upon withdrawing the canula, I found it choked with a bunch of twisted red hairs about four inches in length. Carbolyzed animal ligatures were applied to the bleeding vessels of the omentum, to which there were many adhesions, and a twisted catgut to the pedicle. The tumor weighed forty-three pounds, twenty pounds of which were contained in a large cyst; opening into this was a smaller cyst twelve inches in circumference, filled with sebaceous material, lime, and hair. By the side of these was a multilocular sac composed of about forty or fifty smaller ones containing fat, colloid, bits of cartilage, long dark hair, bones, and teeth. The teeth, with one exception, had crowns and pulps, but no fangs. Attached to the outer side of this cyst was a lateral incisor with root, neck, and crown. In *one* sac, a bone, resembling somewhat a superior maxilla, was found, and on the opposite side, teeth resembling a lower incisor, a bicuspid, and a molar were crowded together. Several pieces of bone were also present, two somewhat resembling scapulæ, and a nondescript osseous formation looking somewhat like the manubrium of the sternum. On the day after the operation, her morning temperature was $100\frac{1}{4}^{\circ}$ and her pulse 100. At 5 P.M., temperature $101\frac{1}{4}^{\circ}$, pulse 148. On the second day, her morning record stood, temperature $99\frac{3}{4}^{\circ}$, pulse 120, and at 2 P.M., her temperature 98° , pulse 116. The third day, I was out of the city, and did not see her until midnight, temperature $104\frac{1}{4}^{\circ}$, pulse 160. She died the fourth day at 10 P.M. Portions of the peritoneum and omentum were completely gangrenous, as shown by the autopsy.

This case was to me most interesting, from the fact that it contradicted Dr. Peaslee's assertion that dermoid cysts do not contain albumen, and because the hair and sebaceous matter were usually found together, as were colloid material and bone. The mode of development of dermoid cysts cannot be entered upon here, perhaps the most satisfactory explanation being the invagination of the external layer of the blastodermic membrane.

With reference to the difficulties of diagnosis surrounding

this variety of cysts, I may refer the reader to Atlee, who relates six cases—two diagnosed “ovarian dropsy;” the third, “some variety of ovarian cysts;” the fourth was declared to be “a pedunculated fibroid;” the fifth, “an indefinable tumor somewhere in the abdominal cavity,” and the sixth, as “uterine fibroid tumors.”¹

CASE VI.—*Multilocular composite tumor of the ovary. Mistaken for Pregnancy. Long incision. Enucleation. Recovery.*

Mrs. —, aged twenty-six. About ten months before I saw her, was taken with morning sickness, arrest of the menstrual function, and gradual and symmetrical enlargement of the abdomen. She supposed herself enceinte, and was so pronounced by her medical attendant. She passed the usual time of delivery, and still continuing to enlarge, I was sent for to see her in consultation. Fluctuation was distinct, and I drew off about four quarts of tenacious and inky fluid, which showed Drysdale's corpuscles in abundance. In two weeks after, I operated upon her. The adhesions were so numerous and so widely distributed that I proceeded to enucleate the tumor, which, after a great deal of time and labor, I succeeded in accomplishing. She suffered most severely from shock, which was followed by peritonitis, from which, however, she recovered in due season.

CASE VII.—*Multilocular ovarian cyst. Spontaneous rupture. Collapse. Ovariectomy. Tumor weighing seventy pounds. Recovery.*

Mrs. —, aged forty-nine years; has had two miscarriages at three months, otherwise has enjoyed good health. About eighteen months before I saw her, she noticed a gradual enlargement of the abdomen, which in June measured fifty-eight inches in circumference, and during the next two months increased to sixty-three inches. On August 1st, her physician was hastily summoned and found her in a state of collapse. The attendants stated that, about half an hour before the doctor was called, she had felt “something giving way,” and passed *per vaginam* a large amount of fluid and rapidly collapsed. An examination of the abdomen showed the middle section of the tumor had disappeared. Four days later, twenty-one pints of similar fluid passed through the vagina, accompanied by nausea and vomiting, and twenty-four hours after, about half the quantity. The abdomen then measured forty-nine inches. These discharges took place at intervals from ten to thirty days. Ovariectomy was performed in the usual way. The whole left anterior wall of the cyst was adherent to the parietes of the abdomen, the posterior adhesions were chiefly omental and interstitial. I ligated all the adhesions with a Peaslee's needle threaded with catgut, and cut them carefully with a scissors. I then clamped the pedicle, secured it in five sections,

¹ Atlee: Ovarian Tumors, pp. 171-193.

with carbolized gut and divided it with Paquelin's thermo-cautery scissors, inserted a glass drainage tube, and put her to bed. The tumor and contents weighed within a fraction of seventy pounds. With the exception of some vesical irritation, which cantharides relieved, she made a good recovery in about seven weeks.

CASE VIII.—*Double ovariectomy. Papillary cysts. Atresia vaginæ. Recovery.*

This case was one of unusual interest, both from its previous history, the condition of both ovaries, and the peculiar appearance presented in the abdominal cavity after it had been opened.

Mrs. —, aged twenty-six. Her history from girlhood was that of pelvic peritonitis. She menstruated at sixteen, and in her eighteenth year, after several months of severe pain, discharged a large quantity of pus *per vaginam*, which diminished considerably a swelling in the right groin. Three years after, another profuse discharge of pus came from the rectum, after which she regained her ordinary health. About a year before her admission to the hospital, she had another severe attack of general peritonitis, her abdomen remaining sensitive afterward. When I examined her, I found the vagina pervious about one inch, when the finger impinged upon a firm cicatricial band. She had most excruciating pain during menstruation which was scanty, but passed through the natural channel. Knowing from this that there must be some outlet, I deferred further exploration until the next period, on the second day of which I examined her and discovered the flux oozing slowly through a minute orifice in the roof of the closed vagina. Into this I passed a probe, then a uterine dilator, and finally succeeded in introducing my finger, which soon enabled me, with careful manipulation, to open the vagina thoroughly to the *os uteri*. During the time I was occupied in this, I had my assistants aspirate her, and two gallons of a dark-brown, ropy fluid, full of Drysdale's corpuscles, were removed. These operations were followed by great relief, but her abdomen soon enlarged again, and being certain of ovarian cystoma, I operated upon her. The usual incisions were made, and as soon as I came upon the peritoneum, which bulged up, I saw, much to my chagrin, that there was no cyst-wall beneath, and therefore concluded that the case was one of encysted dropsy. However, I rolled her three-quarter face over the edge of the table, and slit up the peritoneum, when a gallon and a half of fluid such as I had before drawn, was removed. Introducing my hand on the left side, I came down upon what I thought was a cancerous (encephaloid) mass, friable, soft and bleeding; to my surprise it had scarcely any attachments, and I lifted it out with my hands. For a moment it seemed as if the pelvis would overrun with blood. Taking a large flat sponge, I dipped it in hot water, rammed it tight down with a sponge holder, gave it to an assistant to keep firmly pressed on the part, and then felt on the right side. There an exactly similar

mass was found, but with a distinct pedicle, which I ligated with carbolized silk, divided with the knife and thoroughly cauterized with Paquelin's cautery. When I removed the sponge from the other side, all bleeding had ceased, and when the cavity was cleaned, the empty basin of the pelvis presented, neither intestines nor omentum coming down, being held up by the previous peritoneal adhesions. The woman made a rapid recovery.

Speaking of these papillary cysts, Peaslee says, "We may now understand how the abnormal development of papillæ within one of the cysts of a tumor of this class may be mistaken for medullary cancer of the ovary. So long as the cysts containing cauliflower excrescences formed by hypertrophy of the papillæ remain closed, no such appearance is presented. But if the cyst bursts, its fluid escapes into the peritoneal cavity, and the papillæ, left free to project from the collapsed cyst, and to increase in length and size, generally assume the encephaloid or dendritic appearance." And Noeggerath, in a very valuable paper,¹ thus speaks of the *cystoma proliferum papillare*. "A peculiar species of papillary cystoma is noteworthy on account of the great extent and volume of the papillary growths, its inner surface being partially or entirely covered with vibratile epithelium, which makes it probable that it originates from the parovarium."

CASE IX.—*Encysted dropsy of the peritoneum, exploratory incision. Death on the second day.*

Mrs. —, aged thirty-nine. About a year before her admission, she observed "a swelling" in the left iliac fossa which increased slowly until I saw her, when she presented the appearance of a woman seven months advanced in pregnancy. Her abdomen was conical, the lower portion of the chest protruding, with dullness over the entire surface of the tumor and resonance at the flanks, especially of the right side. Her menstruation had been irregular but not painful, and the lower abdominal veins were enlarged. There was no anasarca; change of position did not alter the contour of the abdomen. The superficies of the abdomen was smooth and symmetrical—not a nodule being anywhere found—upon a second and more careful examination, although no bulging could be found in the median recto-uterine pouch, a little behind the right broad ligament (the recto-ovarian pouch of Sappey), there was a "boggy feel." When, however, she arose from the dorsal decubitus, the recti being contracted, there was considerable bulging between them. This was the symptom that was perplexing. I therefore drew off some of the fluid, which was highly albuminous, and saw, or thought I saw, distinctly granular bodies,

¹ AMERICAN JOURNAL OF OBSTETRICS, January, 1880.

which I believed to be the corpuscles of Drysdale—an exploratory incision was the only resort, and death the result on the second day. The autopsy showed many adhesive bands extending from the colon to the peritoneum. The pelvic viscera were matted together, and a great amount of tubercular deposit was found in the mesentery, which was also shrunken, friable, and in many points “cheesy,” resembling in fact a true scirrhus (peritonitis deformans). The fluid was completely encysted, and there was no disease whatever of the uterus or ovaries.

The above case appears worthy of record, because encysted dropsy of the peritoneum, especially above the sub-peritoneal pelvic space, is a rare affection, and because many of the symptoms were not those generally said to be diagnostic of such a condition.

In the *Obstetrical Journal of Great Britain*, Dr. Routh records three cases of this peculiar condition, which were diagnosed by the surgeons of the Samaritan Hospital as ovarian cystoma. One of the cases Mr. Wells supposed was an extra-ovarian cyst. *All were tapped, and all died.* He finishes his paper with these words: “These three cases, although all unfortunate, illustrate this point in practice, that where you have adhesions of the colon, and especially if the induration is more marked on the one side than on the other, it is extremely difficult, if not absolutely impossible, to diagnose the pseudo-cyst from a real ovarian or extra-ovarian cyst.”¹

CASE X.—*Multilocular cysts. Ovariectomy. Great emaciation and anemia. Peritonitis. Recovery.*

Mrs. —, aged twenty-six; mother of two children. Fifteen months before admission noticed an enlargement of her abdomen, which slowly increased for nine months and then grew with rapidity. In this case the pedicle was tied with carbolized silk in three sections, and severed with Paquelin's scissors, the adhesions which were numerous were treated in the same manner, in some instances they were tied in three or even four sections. The patient was pulseless; she was lifted from the table, but three or four hypodermics of whiskey revived her, and reaction was established in about five hours. On the morning of the third day, her urine showed a specific gravity of 1037 and her temperature was 103°. On the fourth day, her abdomen was tympanitic and sensitive, and her temperature 104°. The cold coil was placed upon her abdomen, and aconite was given. On the sixth day, her temperature was reduced to 102½° and her pulse to 93. She passed from twelve to twenty ounces of urine with a specific gravity of 1030, containing blood-corpuscles but no casts. The following

¹ *Obstetrical Journal of Great Britain*, April, 1874.

days her temperature rose to $103\frac{7}{8}$, but soon declined and she made a good recovery.

The emaciated condition of this patient, her frail habit of body and her especially feeble pulse, would appear unfavorable for the performance of ovariectomy, but it frequently happens that these peculiarly anemic patients bear the operation better than those more robust. Who that is familiar with ovariectomy has not seen these apparently lifeless subjects, cold, blue, and pulseless, lifted from the operating table, and seen them rally slowly but surely from the shock, escaping both peritonitis and septicemia, while on the other hand, healthier looking women have sunk rapidly, or at least seem more predisposed to split upon all the rocks and shoals which surround the operation, the first two weeks after its performance. I recollect reading in the *British Medical Journal*, some years since, the records of an operation performed by Mr. Keith upon a suppurating and burst cyst, which appeared hopeless at the outset and yet the patient recovered. In concluding his remarks, Mr. Keith expressed his opinion that in no case should the operation be refused, and Dr. Goodell, in discussing this subject, is emphatic on this point.

CASE XI.—*Colloid cyst of the ovary. Case diagnosed as cancer of omentum. Ovariectomy. Recovery.*

Mrs. —, age forty-four; mother of four children; the eldest being now twenty-four years old. When I saw her, she was confined to the bed, was extremely weak, and was failing fast. Six months before her admission she had suffered from a severe attack of peritonitis, lasting three weeks. At the first examination, she was very nervous and suffered from complete insomnia and anorexia and was much emaciated. There was the usual dulness on percussion over the abdomen, the walls of which were irregular, with more protrusion on the right than on the left side. There existed also what might be called semi-fluctuation (about that sensation imparted to the fingers in fibro-cysts and in some large fatty tumors) on the right side, while on the left the fluctuation was distinct. Aspiration drew a greenish fluid, full of Drysdale's corpuscles and the usual elements. The operation was performed as usual, the pedicle treated with silk ligature and severed with the canterry. A flat carbolized sponge was placed under the whole length of the incision while the wires were being inserted (after the manner of Keith as described by Sims) and the carbolized dressings used. Before the effects of the ether passed off, she received two hypodermics of brandy. The second day two ounces of bloody serum were removed from the drainage tube, and after this I inserted into the tube a long piece of ordinary lamp-wick,

led it off into a small basin containing a solution of carbolized water one to one hundred, and found it quite effectual in absorbing the fluids, which became very offensive. In addition to this, the cavity was washed twice a day with two quarts of carbolized water one to one hundred, at a temperature of 100°. She made an excellent recovery in four weeks.

CASE XII.—*Ovarian cystoma, overlaid by a cyst of the urachus which had burst during childhood and obliterated the umbilicus. Ovariectomy. Death.*

Mrs. —, aged fifty-four; a Swiss, of small stature and slightly built; married and childless. At the age of seven years her abdomen appeared to be enlarged; at fourteen a tumor, the size of an apple, appeared at the umbilicus, which burst, sending forth a stream of water with considerable force. Her menses ceased at the age of forty-four, when her abdomen became enlarged and sensitive to pressure. Incontinence of urine was a source of great discomfort to her, especially at night, when the dripping would awaken her. I withdrew with the aspirator about a quart of viscid dark fluid, which showed inflammatory and pus-corpuscles, oil and blood globules, and a profusion of Drysdale's granular bodies. In the ovariectomy, after dividing the peritoneum, I came upon a substance which puzzled me; it looked somewhat like a cyst-wall, but was so densely adherent to the abdomen at the umbilicus that it was impossible to separate the adhesion; laterally (on each side of the incision) the substance disappeared. After vainly endeavoring to push this sufficiently aside, I determined to incise it, which I did. A gush of fluid followed, and for a moment I believed I had opened the sac. Upon introducing my fingers into the incision I soon discovered that the canal communicated directly with the bladder. I then forcibly drew this emptied cyst aside and without difficulty removed the tumor. From some experience in supra-pubic lithotomy I determined to bring the wall of the bladder cyst together with carbolized catgut, which I did. A self-retaining catheter was placed in the bladder and the woman put to bed. She died on the evening of the fifth day from peritonitis.

This case of patulous and cystic urachus, leading from the fundus of the bladder to the umbilicus, accounts for many peculiar symptoms detailed by the patient. The bursting of the umbilicus in early life when "the water spouted up to the ceiling" was the rupture of the external wall of the cyst which indeed was proven by the cicatrix, smooth and white, which occupied that point in the abdominal wall where the navel should have been. Dr. Atlee¹ in his tenth case had somewhat the same experience and thus writes of it: "The only conclusion possi-

¹ Ovarian Tumors, p. 51.

ble, considering the extraperitoneal and elevated locality of this urinous cyst, is that it was a purse in a dilated urachus, which, although closed at the umbilicus, had from birth maintained a communication with the bladder. For such freaks of nature no surgeon can be held responsible, nor can he guard against them." A somewhat similar case is recorded in the *Medical Record* for January, 1878, and Dr. T. G. Thomas has more recently operated for a like condition with success.¹

CASE XIII.—*Multilocular cysts. Elevenappings. Over two hundred pounds of fluid removed. Septicemia. Recovery.*

Mrs. —, aged forty-seven; married; gave birth to one child twenty-three years since; when admitted presented all the symptoms of ovarian cystoma. Had been tapped by her physician eleven times, the whole amount of fluid removed being that mentioned above. Ovariectomy performed as usual, pedicle tied in five sections, severed with knife and cauterized with Paquelin's cautery, the adhesions were dense and there was considerable hemorrhage, although most of them were tied with the animal ligature. A drainage tube also was used. She went on well for five days, when her temperature rose to 103°, with severe pains in her legs, profuse sweats and great prostration. From three to four ounces of putrid pus were removed night and morning from the cavity by means of a syringe with a long nozzle, and afterwards the abdominal cavity washed with carbolized water (one to one hundred) at a temperature of 100°.

The effect of large quantities of stimulants in antidoting the toxic effects of poisonous substances introduced into the blood is well known to the profession, and in many cases of septicemia and pyemia and also in the bites of venomous snakes, I have had personal experience which has been so satisfactory that, in such cases, no matter what other medical treatment is employed, I invariably push the alcoholic stimulant to its utmost, and it is astonishing to observe to what an extent a zymotic system will bear such stimulation.

This treatment was vigorously pursued in this case, and the patient made a slow but a perfect recovery.

CASE XIV.—*Polycystic tumor of the ovary—tender sac. Extensive adhesions. Ovariectomy. Recovery.*

Mrs. —, aged 41. First pregnancy twelve years before her admission to hospital, but she miscarried at six months. Her second pregnancy also resulted in like manner at five months. Two years before she came to me, she noticed a tumor of the abdomen, which gradually enlarged until she measured at the

¹ AMERICAN JOURNAL OF OBSTETRICS, July, 1881, p. 672.

umbilicus forty-four inches. Had been aspirated once. The fluid showed an abundance of ovarian granules, and was dark-brown in color, viscid, and ropy. Her strength was rapidly failing, and ovariectomy was finally performed. The operation was as usual, excepting very prolonged, on account of the numerous adhesions, which were attached to the liver, the intestines, and omentum in such manner that it was difficult to separate them from these organs, especially as the sac was so friable. In many places, I tied the adhesion and then cut out with a scissors the portion of the cyst-wall, allowing it to remain in the cavity of the abdomen. She made a good recovery in four weeks.

CASE XV.—*Multilocular ovarian cystoma with colloid contents, accompanied with encysted dropsy of the peritoneum from chronic pelvic peritonitis. A very large fibrinous clot between the peritoneum and sac. Death on the fourteenth day from secondary hemorrhage.*

Mrs. —, aged 45 years. Menses appeared at the age of thirteen, and were irregular ever after. She had suffered from cough with blood-streaked expectoration, and had been pronounced a hopeless case of tuberculosis. However, she lived, and gradually grew stout. Three years before I saw her, she noticed an enlargement of the abdomen, which disappeared after six months, but again made its appearance, and grew with irregular rapidity until she measured $54\frac{1}{2}$ inches. Upon exposing the abdomen, it was more square than conical, looking as though a soft pillow had been stuffed into it; fluctuation was distinct. The sound entered about three inches; there was no fluctuation in Douglas' pouch; the limbs and abdominal walls were anasarcaous. Upon introducing a good-sized aspirating needle, I was surprised to find that no fluid could be removed by suction, but when I withdrew the instrument, a thin stream of coffee-colored liquid spurted from the puncture. Ovariectomy was then performed in the usual manner. Upon reaching the peritoneum, it was found much thickened and protruding through the opening, presented a bluish appearance. I then introduced into the membrane a Wells' trocar, and to my amazement nothing escaped through the tubing. The trocar was withdrawn when a gush of fluid followed. I then divided the peritoneum the entire length of the wound, when there bulged up an immense mass of what appeared to be clotted blood. Introducing my hand into the cavity, I turned out a mass in size and shape resembling a very large placenta, the removal of which was followed by the pouring out of a bucketful of fluid. It was this substance into which I passed the aspirating needle and trocar, thus accounting for the dry tapping. As soon as the abdomen was cleansed, the sac came clearly to view, and was emptied in the usual way. The adhesions were vascular, dense, and numerous, and the sac so friable that it separated in many places. The pedicle appeared soft and spongy, and was ligated in three sections with carbolized gut. This operation lasted nearly two hours, and was difficult and tedious. After carefully

cleansing the abdomen, a glass drainage-tube was inserted, and the wound closed as usual, including the peritoneum in the sutures. On the eleventh day, her pulse was 124 and her temperature $99\frac{1}{4}^{\circ}$. On the twelfth day, I received a telegram urging me to visit her. Her temperature had risen to $102\frac{1}{2}^{\circ}$, and her pulse was 144, and a most profuse hemorrhage had taken place from the drainage-tube. The parts were cleansed, and upon withdrawing the tube, there appeared to be a substance protruding from the wound. I introduced a forceps, and lifted out the pedicle stump, rounded on one side but sloughing on the other. Compression with ice-bags, brandy, and secale brought about reaction, but two days later a profuse hemorrhage again ensued which terminated her life.

From a careful reading of this case, I am disposed to believe that, from a long existing pelvic peritonitis, effusion had taken place within the abdominal cavity, and afterwards from a rupture of blood-vessels, perhaps the pampiniform plexus, a hematocele was formed. So soon as the exuded blood came in contact with the dropsical effusion, coagulation resulted, which would account for the fibrinous mass found immediately below the peritoneum and above the sac. This fact, viz., the formation of fibrin by contact of the red blood-globules with the fibrogenous substance contained in inflammatory exudations, was, I think, first pointed out by Alexander Schmidt, and is an important point to be remembered in connection with all inflammatory exudations.

CASE XVI.—*Myo-fibroma. Profuse and exhausting hemorrhages. Battey's operation. Recovery.*

Mrs. —, æt. 37. Menstruated at the age of fifteen, the flux continuing from six to eight days. Six years before I saw her, she noticed a hard tumor a little to the left of the median line, not tender, which was accompanied from time to time with profuse bleeding. Her strength failed, and she emaciated rapidly. In September, 1880, she was put upon the hypodermic use of ergot, which was faithfully carried out for a year, during which time she was confined to her bed, her strength failing gradually. On Oct. 4th, 1881, I removed her ovaries by the abdominal incision. The division of the peritoneum revealed the pearly-white appearance of the tumor, which was pushed aside, and the left ovary lying somewhat behind the growth, was easily reached; the pedicle ligated with carbolized silk (cut short) and dropped back. The right ovary was much more difficult to bring out at the incision on account of the adhesions. On the third day, she showed symptoms of peritonitis, which was treated by the dry cold coil on the abdomen. On the sixth day, the parotid began to enlarge. The report reads, on the 11th of October: "Restless night, paro-

tid enormously enlarged and very tender, cannot articulate, collapsed, surface cold, pupils dilated, pulse 135, temperature 102.6°." This condition of things continued until the 17th, when a free incision into the parotid evacuated a large quantity of pus. After this she slowly recovered. During the first ten or twelve days, there was a sanguineous discharge from the vagina. Since the operation she has menstruated several times. At the present, she is out and attending to her affairs, the tumor having diminished about two-thirds its original size.

CASE XVII.—*Myo-fibroma. Metrorrhagia. Battey's operation. Recovery.*

Miss —, æt. 35. Menses appeared at fifteen years of age. She says that, in the winter of 1873-'74, it was an established fact of indefinite standing that the menses appeared every three weeks, lasted six days, and were always very profuse. In the spring of 1877, the menstrual flux continued from seven to nine days, was always exhausting, accompanied with great sleepiness and mental depression. For these symptoms, her physician prescribed ergot and change of climate, which benefited her materially. In 1879, her sufferings had much increased. Her chief symptoms were pressure in the uterine region, severe headache, sensitiveness over the entire abdomen, weariness, and sleepiness. In 1880, the metrorrhagia had increased alarmingly, and in November of the same year, she noticed a tumor about the size of a fetal head in the lower portion of the abdomen. In the spring of 1881, she had an alarming hemorrhage, and, in October, another which endangered her life. In November, I performed Battey's operation upon her. The ovaries were removed without much difficulty. During her convalescence, an abscess formed over the stump of the left ovary, and she was afflicted with a lymphangitis of the left leg. The tumor has diminished to half its original size, her general health has been very much improved, and though she has apparently menstruated twice; she has had no hemorrhage whatsoever.

My first case of Battey's operation was performed on the 20th of May, 1878, at the Ward's Island Hospital. The patient was about forty years old; was emaciated and exhausted from the most agonizing dysmenorrhea I have ever known. Her history was one of continued peritonitis, and I think now, with hydro-salpinx. She was in a very low condition when the operation was performed, and the ovaries were degenerate, small, and bound down by many adhesions, especially on the right side. She died of shock on the second day. Dr. Thomas has lately reported a case of death from this operation.¹

Mr. Lawson Tait, in his last table, gives the record of thirty-

¹ AMERICAN JOURNAL OF OBSTETRICS, July, 1881, p. 672.

one cases of this operation, from which we learn that was it undertaken for myoma, with exhausting hemorrhages, in twenty cases, of which four died; for cystoma of the ovaries, in six cases, all of which recovered; for ovaritis, in three cases, none being lost; for cyst of the Fallopian tubes, in one case, which was "greatly improved," and for cirrhosis of the appendages, in one case, which also recovered. Dr. Thomas Savage, of Birmingham, England, also records thirty cases, ten of which were for painful ovary-prolapse, and four for myoma. For these two especial conditions he thinks the operation especially applicable.

CASE XVIII.—*Total extirpation of the uterus for extensive cancer of the cervix. Freund's abdominal method. Death from shock.*

Mrs. —, aged thirty-eight. This patient had enjoyed fair health until about eighteen months before her admission into the hospital, when she noticed an acrid discharge from the vagina. A physician informed her, after careful examination, that she was suffering from ulceration and hyperplasia of the cervix, for which various medicines were prescribed and many applications made. Growing rapidly worse, she was sent to me for examination. It required but little time to arrive at a diagnosis. The vagina was more than half filled with a mass of ulcerating epithelioma, which had scooped out the cervix, which itself was very much enlarged and infiltrated. The cachexia was marked, and the hemorrhages had of late become profuse, with that cancerous odor which I think often is pathognomonic. There was, however, no infiltration of the vaginal walls. Knowing that in this condition she had not long to live, and that a miserable death awaited her, I explained to herself and her friends her present condition and ultimate prospects, and also laid clearly before them the dangers and difficulties surrounding so severe an operation as the complete extirpation of the uterus. After due consideration, all parties consented to the operation.

The patient was thoroughly etherized, placed upon the table, and a large pillow laid under the nates, to allow the intestines to gravitate toward the diaphragm. The incision was commenced just below the umbilicus, and extended downward upon the pubic bones. The peritoneum was opened, and as the omentum and intestines protruded, they were not drawn out, as first recommended by Freund (who now has a netting to inclose them), but held within the cavity with soft flannels, wrung out in hot water. The fundus of the uterus then came in view just about on a level with the pubic symphysis. Hanks' hooks were used to draw up the organ, which was steadied and elevated by an assistant, with his fingers in the rectum. The right broad ligament was then drawn forward, and the upper two-thirds of it ligated in two sections, and then divided close to the uterus. The left ligament was treated in the same manner. There was smart hemorrhage on both sides, which required ligatures. After the bleeding had

ceased, I introduced my finger into the vagina, and carried it over the anterior lip of the cervix, and keeping it as a guide, firmly pressed upon the cervico-vaginal junction, I pushed a sharp-pointed knife through the mucous membrane. Into this opening, and keeping close to the cervix, a Stohlmann's hysterotome was passed, the blades opened, and withdrawn, thus making a clean cut in front of the cervix. A similar method was adopted posteriorly, the hysterotome being entered at the centre of Douglas' pouch; thus, the anterior and posterior junctions of the vagina were cleanly divided, leaving the lateral connections containing the uterine arteries intact. These incisions were made as close to the body of the uterus as possible to avoid inclosing the ureters when the ligatures were applied. Simple as this procedure is to *write*, it was by no means so facile in its accomplishment, on account of the immense size of the cervix, which projected into the vagina, as a champagne cork does into the neck of the bottle, tightly constricted at the mouth, but expanding in the neck. In attempting to puncture the cul-de-sac posteriorly, I passed the instrument *through* instead of behind the cancerous mass. This occasioned some hemorrhage, and I was obliged to make a second attempt, which succeeded; passing then the finger of the left hand into the anterior opening in front of the cervix. The right hand was introduced through the abdominal wound, and the bladder separated from the uterus. This was accomplished partly with the fingers and partly with a blunt-pointed scissors curved on the flat.

This is said by some also to be easy of accomplishment. I did not find it so; on the contrary, it was difficult. The rectum was separated in like manner, the uterus being drawn forward by an assistant. I then carried a ligature on the right side, through the openings made anteriorly and posteriorly, and drawing the bladder away, tied the silk tightly, and proceeded to sever this lower segment of the broad ligament. As I did this, a profuse gush of blood told me that I had not secured the uterine artery, which, however, I was fortunate enough to do with a pair of clamp-forceps with long handles. The mass was now so movable that I was able to draw it far out of the pelvis and apply a ligature to the lower segment of the left broad ligament, which was cut through without bleeding, and the uterus removed with a few applications of the scissors. All the ligatures were left with long ends, which were drawn through the vaginal opening, which was left open for drainage. Before the operation, in considering the different methods adopted in securing the uterine arteries, I gave preference to the one already described, for, unless the needle, after it has been passed in front of the broad ligament and threaded, is brought down and re-introduced at its point of entrance (a difficult manœuvre), the result will not be attained. Freund, however, has modified his method of late on account of this difficulty. The abdomen was carefully cleansed, and the wound closed with silver sutures, including the peritoneum. The woman died of shock within the hour.

This description is very easy to write, but whoever considers the operation as not difficult to perform may attempt it for himself and "*experientia docet.*" I think I shall not put it in practice again. If a cancer of the cervix cannot be removed after the methods of Sims, Thomas, Emmet, and Byrne, it is preferable, in my opinion, to palliate the symptoms rather than resort to this dangerous expedient.

MASSAGE AND EXPRESSION OR EXTERNAL MANIPULATIONS IN THE OBSTETRIC PRACTICE OF PRIMITIVE PEOPLE.

BY

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AMONG the latest and most important advances in obstetric practice is the adaptation of external manipulations to midwifery: massage and compression of the uterine globe, for the purpose of exciting muscular activity and mechanically forcing out the contents of the cavity. This is of the utmost importance in checking hemorrhage from a relaxed womb, in the expression of a retarded placenta (Credé's method) or an aftercoming head, and in the rectification of malpositions (Wright's or Braxton Hicks' combined version).

Although these are recent and valued additions, so recent that they are not as yet practised by any but the more advanced obstetricians, they are the most natural, the simplest, and oldest helps in midwifery, in use among all primitive people and at all times, from the day of the ancient Hebrews and Arabs to that of the North American Indians.

Although constantly practised by primitive people for thousands of years, these methods have been recently rediscovered by learned men, clothed in scientific principle, and given to the world as new.

Before entering upon the subject proper of this paper, I will briefly outline the history of massage, which, as an alleviant of human suffering, is intimately connected with the history of medicine in its earliest days; almost equally venerable is the history of this art as applied to midwifery, and this leads directly

to the subject in hand, external manipulations in the obstetric practice of primitive people. I will classify the various kinds of massage and expression and define their uses, closing with a comparison of the natural and scientific, and of the development of external manipulation in modern obstetrics.

A. HISTORY OF MASSAGE.

Of all therapeutic agents now in use, not one has been so uniformly and so consistently resorted to, and so successfully practised at all times, as massage: its history leads us back into the darkness of the most remote ages. Homer, in his *Odyssey*, already tells us how beautiful women rubbed and kneaded the anointed limbs of battle-worn heroes; this was to strengthen and rejuvenate the tired body, to give tone to the muscular system.

The oldest historians and physicians, poets and travellers, speak of massage and give very accurate descriptions, and modern travellers tell us of its use all over the globe; eastern travellers especially tell us of the luxury of massage in combination with the bath after wearisome exertion or labor.

In Rome we often hear of massage: Martial so speaks of it, slaves rubbed and anointed bathers in the public baths under Nero, Domitian, and Trajan.

Thus it served to strengthen muscle and nerve, but how much more evident that it should be resorted to for the purpose of alleviating pain: we instinctively place our hands upon a spot which pains, and by pressure seek to relieve it.

In acute diseases, Hippocrates advises detersive kneading, the *douche*, and the anointing of the body; those procedures which, combined, form part of the bath as prescribed for therapeutic purposes. In treating of the diseases of the joints, the brilliant Sage of Cos gives utterance to these memorable words: "the physician should be well versed in many arts, and among others, in that of massage; massage will strengthen the relaxed ligaments of a joint, and relax those which are too rigid." The father of medicine knew that by well-directed manipulations the ligaments could be strengthened, could be rendered pliable, and movement thus restored. Herodotus also gives careful directions as to this method of treating such disturbances.

In China and India, massage has been known since ancient times. The Chinese knead or rub down the entire body with their hands and exercise a gentle pressure on all the joints, together with a certain traction which is followed by a distinct noise, as is sometimes made by persons playfully distending the joints of the fingers. Masseurs wander about the streets and cry out, lauding their talents. The Chinese themselves brought this art from India; that ancient Indian work the *Artharva-veda*, discovered towards the end of the last century by Sir William Jones, contains a part devoted to medicine—the *Ayur-veda*; in this every one who looks for perfect health is advised to rise early, rinse his mouth, and then undergo a process of shampooing or massage. Upon the Pacific Islands, also, massage is well known, as we learn from the writings of Cook and Captain Wallis. The practice of kneading the body with the hands was imported into Europe by the crusaders from Syria and Palestine, together with the use of the warm bath. Unfortunately the art soon fell into the hands of quacks, but it was again brought within the sphere of medicine proper by Fabricius ab Aquapendente, the scholar of Fallopius, who utilized it, especially for affections of the joints, such as ankylosis and others. At the same period, combined active and passive motion was advocated by Mercurialis, Paracelsus, and Prosper Alpini, who highly praises flexion and massage in his work, *De Medicina Egyptiorum*, Venice, 1591, and says that in Egypt massage was so popular that no one could leave a bath without undergoing the process. The advocates of the art in the last century were Hoffman and Tissot.

During the first years of this century the translation of the book of Cong-Fou, of the *Bonzae* by Tao-Ssé, by the missionaries Hue and Amiot, created a great sensation; and this seems to have formed the basis of Peter Ling's Swedish gymnastics as proven by Dally and Estradere, although not in any way mentioned by Ling himself. Still Ling and his successor Branting did much good. In the northern countries, in Russia, Prussia, in Denmark, and especially in Sweden, the *Kinesi-therapie*, or treatment by massage, is highly esteemed; and the names of Ling and Meding are greatly honored in connection with this method. The most illustrious practitioners of the day throughout Europe are beginning to resort to it in

various affections. Among them I will mention especially the names of Blache, Sée, Roger, Guersant, Gosselin, Récamier, Sarlandier, Metzger, and above all Nélaton and Trousseau, and in obstetrics, Kristeller, Credé, and Martin.

The numerous manipulations practised in massage will be best understood if divided into four classes.

First, a gentle rubbing (*effleurage*, *friction douce*). An easy gliding of the palmar aspect of the hand and fingers over the parts. The maximum of pressure hereby exercised ought never to be greater than the weight of the gliding hand.

Second, pressure (*pression*, *friction forte*, *massage*). A firm intermittent compression of the muscles and their coverings by the hands or fingers. The force used is measured only by the strength of the masseur.

Third, kneading (*petrissage*, *malaxation*). A methodical pressure exercised upon the muscles with the entire hand or fist in a perpendicular direction, best compared to the kneading of dough.

Fourth, functional movements (*mouvements*, *function*). Variable attitudes and motions undertaken by the patient with the assistance of the masseur upon various movable parts of the body, such as the sufferer had not been able to freely practise alone: supination and rotation, for instance.

The physiological effects are readily seen. The circulation is improved, absorption is furthered, pain is eased, the nerves are strengthened, the nervous system is especially quieted, and the physiological activity of the body increased without cost of fuel—muscular or nervous exertion—to the patient. There is a probability of a greatly stimulated idio-muscular contractility; and it seems as if massage had an effect similar to electricity upon the muscles. The contractions aroused by massage are a great factor in the process of absorption generated by it. The importance of massage in obstetric practice is at once evident. Its soothing, nerve-quieting influence allays the excitement of the patient; the muscles are stimulated to increased activity; and these abdominal manipulations will serve a most excellent purpose in uterine inertia. They are absolutely harmless, uterine activity is increased, the expression of the child hastened, and, after it is delivered, the uterine contraction furthered, and in case of atony, that is overcome and hemorrhage checked;

but pressure upon the fundus, the direct *vis a tergo*, is, above all others, one of the most important factors in obstetric practice, and, by reason of its simplicity, within reach of every one. Recently rediscovered by scientific obstetricians, primitive people, thrown upon their own resources, have practised these methods at all times.

B. HISTORY OF EXTERNAL MANIPULATIONS IN OBSTETRIC PRACTICE.

It is evident, then, that external manipulations—massage and expression—should have played an important part in the history of midwifery among primitive people at all times. First of all, it was their only help; the only way in which they could force labor was the expression of the unwilling fetus from the womb. The *vis a tergo* was their only resort; and secondly, if properly applied, the methods are unexcelled and correct, both upon mechanical and physiological principles. I have in my former writings minutely described the obstetric practice of people, savage and civilized, in all ages, so that I need not here dwell at length upon the history of these manipulations.

There is hardly a people, ancient or modern, that do not in some way resort to massage and expression in labor, even if it be a natural and easy one. An obstacle or irregularity of any kind they always sought to overcome by these methods. Hippocrates, in his writings, says: "If you put a fruit-stone into a narrow-neck flask, you may find it impossible to bring it out crosswise; and even so it is with a child when it lies across the mouth of the womb." In the case of plethoric young women, venesection was performed often without effect. Sternutatories were given, and the nose held fast when they began to take effect. If this did not suffice, a still rougher mode of practice was adopted: the patient was laid on her back in bed, while the shoulders and upper part of the body were bound fast, and the end of the bed next her head was then raised and allowed to fall with a jerk, which was supposed to aid in the expulsion. Or four women seized each an arm or a leg, and thus jerked the patient up and down as she lay in bed. If a malposition existed, this same succussion was used with the feet high, so as to shake the child into the roomy portions of the womb.

In Greece, when a woman was in labor, she seated herself

upon a tripod, the nurse seized her from behind around the middle of the body, and rubbed and pressed upon the abdomen with both hands. The ancient Arabian physicians, among them Rhazes, recommend massage, firm rubbing of the abdomen in childbirth; and even now all the Arab tribes of Caucasian origin, on the banks of the Caspian Sea, have nurses to massage the abdomen and the lumbar region. Common as the practice is in Asia, resorted to in all ages for various diseases, it was equally used in labor cases for the double purpose of increasing the force of the uterine contractions, and of causing the expulsion of the ovum by pressure.

Modern means of communication, as well as medical schools, are rapidly doing away with these primitive customs, which were frequently practised in more remote regions of our own States in the early parts of this century. Many of our older physicians tell of their early labor cases in the farm-houses of Virginia, Ohio or Georgia, where the patient was delivered upon the lap of her husband, whose encircling arms exercised a steady pressure upon the descending uterus; even now expression is occasionally practised in this way.

Among our Indians, at least such of them as are not yielding to the civilizing influence of the agency physician or the army surgeon, massage and expression are common, whether the parturient occupies the kneeling, sitting, recumbent, or semi-recumbent position; malpositions are corrected, and labor hastened by the hands of an assistant, who kneads the loins and abdomen, and exercises pressure by the palm of the hands placed upon the uterine globe. Among the natives of Mexico, of Central and South America, it is still common practice. At the time of the Incas, the exit of the child was hastened by the firm compression by an assistant's arms, which closely encircled the waist of the sufferer. Among the Calmucks, the parturient squats down upon her buttocks at the foot of her bed, and braces herself against a pole that descends obliquely from the top of the hut, very similar to the practice now in use among the Mexicans, and the assistant clasps her in her arms, and, when labor begins, seats herself upon the ground, takes the patient upon her knees, and presses and kneads the abdomen from above downward. If the strength of the patient begins to fail, she is placed upon two

boxes, and a strong man, standing behind her, compresses the abdomen with all the strength of his arms. Among the Tartars the nurses hang the woman up by the arms, and compress the abdomen with bandages; sometimes they place a heavy weight on the abdomen.

In the East Indies, they knead the back and loins—*shampoo*. In the seventeenth century, massage was practised in Siam in difficult labors. Hureau de Villeneuve has described this practice under the name of *Cong-fou*. He says that its object is to lessen pain, and explains it by reflex action. The manipulation consists essentially of light rubbing, touching, delicate pressure, tickling, and friction with the ends of the fingers. In this the nurse must be methodical. The manipulations must be made during the pain, and not only upon the abdomen, but also upon the perineum, the groins, the hypochondrium, and over the diaphragm. Among the Japanese, *Ambouk* is a kneading of the body, with the object of expelling the child. They also have a practice called *Seitaz* or version, in which, by external manipulation, they pretend to rectify malpresentations.

The Malays put hot bricks upon the woman's abdomen, and press upon the bricks with all their force. The Negritas clasp the trunk of a bamboo and press against it. In New Caledonia, they use violent pressure and blows of the fist in hard labor. In Senegal, some one sits upon the patient's abdomen. In Old Calabar, the woman is put in a sitting posture, and the nurse compresses the abdomen with the hands anointed with oil. Among the negroes of New Guinea, the parents or friends of the woman assist her by beating or kicking her in the stomach. In Kabylie, no manipulations seem used in ordinary labor, but, what is rare among other people, traction upon the parts already expelled is made; if, however, labor is slow, an assistant butts the patient in the abdomen. She places her head upon the pregnant womb, and clasping her hands behind the patient's back, presses first upon the back, then upon the abdomen to hasten the expulsion of the child. Some of our own Indians strap a pillow of some kind to the abdomen, and lie flat upon the ground, thus to express the fetus; others press the abdomen upon a staff firmly planted in the ground; but, as I have already stated, by far the most common methods

are massage of the back, of the loins, and abdomen, to increase the uterine contraction, and the pressure upon the abdomen by the encircling arms, or by the hands laid upon the uterine globe to express the fetus.

C. THE VARIOUS KINDS OF EXTERNAL MANIPULATION—MASSAGE AND EXPRESSION—IN THE OBSTETRIC PRACTICE OF PRIMITIVE PEOPLE.

I will endeavor to classify the various forms of external manipulations in use among primitive people, taking first, as the most simple, the different forms of (I.) Expression. These are usually practised by an assistant, most frequently (1) by the arms encircling the patient's abdomen, the hands usually clasped in front over the uterine fundus, thus forming a powerful compressor.

(2.) This living compressor may be replaced by a bandage, the ends of which are in the hands of an assistant.

Another method (3) is to draw the patient's abdomen across a rope or pole, so as to force down the uterine globe. In more difficult cases (4), the patient is suspended by a rope, and the uterus stripped down by the weight of an assistant, who hangs upon the abdomen of the sufferer. And (5) an equally uncouth method of expressing the ovum is by the feet of an assistant, or sympathizing friend, who tramps upon the back or belly of the patient, or by a weight placed upon the enlarged abdomen. In some instances, the patient herself exerts the external force (6) by the tightening of a belt; (7) by leaning with the uterine fundus against a staff firmly planted in the ground; or (8) by lying flat upon the ground with a pillow under the abdomen.

II. Massage, or the shampooing of the abdomen, is a somewhat more complicated operation; in almost all cases practised by an assistant, and usually in connection with simple expression. I will merely refer to

III. The shaking out of the ovum; and

IV. Permanent pressure.

I. EXPRESSION.—Simple expression is resorted to among primitive people in almost every labor; it is the most rude and primitive form of external manipulation, and at once suggests itself as an aid to the forces of nature when assistance seems

called for. It is used both in the delivery of the child and of the placenta; and the method which first suggests itself is the one most commonly resorted to.

(1.) *By the arms of an assistant encircling the patient's abdomen.* That this has been so commonly resorted to at all times and by all people is evident when we remember that in so many cases the patient is delivered seated in the lap of an assistant, be it on a chair, or stone, or upon the ground. This position was common in ancient times and modern; I will again refer to the ancient Peruvian urn with the patient seated in the lap of her husband; the method is still in use upon the South American coast, in Peru, in Chili; it was common among the ancient Hebrews, in Rome, and in medieval Italy; also in Greece, ancient and modern. We find it in Africa and India; rarely among the American Indians, where the lazy male is unwilling to undertake this laborious task; here and there among the Scotch and Welsh; in various of the backwood counties of our own States; among the Sandwich Islanders; the Bedouins; and the Kalmucks of Russia.

The same method is resorted to whether the patient is delivered in a standing posture, as among some of our Sioux tribes, or among the Crows and Comanches, where the patient kneels, the assistant kneeling behind her, clasping the abdomen firmly above the uterus, and keeping up steady pressure during the entire labor. Among the Nez-Percés and Gros-Ventres, where the patient assumes the squatting posture, the encircling arms of the assistant exercise the same steady compression. Among the Kootenais, where the parturient is upon her hands and knees, the same method is in use; whilst the woman is on her knees, the face touching the ground, the hands one above the other grasping a pole planted in the ground, and the legs apart, a man straddles her across the buttocks, and with his hands clasped around her waist exercises a steady pressure on the abdomen, pulling, however, only during a pain. The way in which the pressure is exercised is, of course, much the same among different people whatever be the position assumed.

In some rare instances, in the mountainous portions of Germany, the woman is delivered suspended, in the arms of her husband, who seizes her from behind, and raises her up so that

she is bent backward, her toes barely touching the ground. In this position, of course, with his hands clasped above the uterus, a steady and very powerful pressure is exercised. In other cases, as among the Brulé Sioux, and among some of the Iroquois of Canada, the patient hangs to the neck of an assistant, who exercises pressure by forcing his abdomen against that of the patient, his arms around her waist, his hands clasped at her back. A similar method of pressure is exercised by the Japanese obstetrician in correcting malposition during the later months of pregnancy. He, however, uses his hands rather to knead the abdomen than to compress the womb, but very much in the same way as the Sioux assistant.

In the case of a patient seated in the lap of an assistant, the description I find given of a labor among the Sandwich Islanders is characteristic: It is the duty of this assistant, upon whose lap the parturient rests, to grasp the waist above the abdomen in such a way that he or she can press down upon the uterus and its contents with a considerable force, not relaxing this grasp to allow the fetus to recede. The force of the pressure is backward and downward, increased during the pains, and kept up in a moderate steady measure during the interval to prevent a loss of the advantage gained during each pain.

This is resorted to among many of the Mexicans and half-breed Mexicans; among the Andamanese; among such of the Hindoos in India as are delivered in the lap; and among the Burmese. In case that the patient kneels in labor, which is perhaps the most common position among the Indian squaws, the assistant either kneels behind the patient, or stands astride of or between her feet, and encircles the abdomen with her arms, exercising the same constant pressure as when other positions are assumed. This custom we find prevalent among the yellow races as well as the red, in Kamtschatka and Mongolia; less common among the black, in Ethiopia, and also in New Zealand.

(2.) *A bandage passed around the body and tightened by assistants*, supplants, in some cases, the encircling arms: this is not so much the usual practice in ordinary cases, but rather

a severer measure adopted in retarded labor. A description of this method is found in the *Medical Times and Gazette* for



FIG.1.—Bandage as used in Mexico.

August, 1861, describing a labor at Monterey, California:
“The patient was seated in a chair, seizing with her hands a

rope pendent from the ceiling. A bandage was placed about her body, the ends of which were crossed behind, each of which was grasped by an assistant, whose duty it was to make firm traction upon the sheet, and especially to draw tightly as the abdomen diminished in size. They were particularly instructed to make strong traction in the intervals between the pains, lest the abdomen during this time should resume the position it had before the pain came on." Similar accounts I hear from Mexico, from South America, from the north of India. The Finns, in difficult cases, when the child will not advance, force it out by tight compression of a strap placed around the abdomen; the Calmucks likewise follow this custom.

The Klatsoos use a bandage only for the expression of the after-birth, and this appears to me to be a very reasonable procedure; a bandage is placed about the abdomen of the patient after the delivery of the child, thus not only aiding the expression of the placenta, but preventing the expansion of the womb; in other words, preventing post-partum hemorrhage, and furthering the necessary contractions. The Piute Indians make use of a bandage in a somewhat different way; they clasp a leather girdle around the waist above the fundus of the womb, not so tight-fitting but that it will slip up and down on the body; then, as the expulsive pains come on, three, four, or more women push the girdle down after the escaping child. They regard the descent of the child as voluntary on its part, and push the girdle down to support it in any progress it makes from time to time, that it shall not lose its foothold and slip back, and thereby lose all the distance gained by the effort for food and day-light: so as labor progresses, the child's footsteps are followed up by this girdle, until it is finally expelled; or, as they say, it has asserted its freedom and broken its fast.

(3.) *Drawing the abdomen across a rope or pole.* A peculiar custom, which we have not found elsewhere, exists among the Winnebagos and Chippewas. In difficult cases, more common among the more civilized Indians who have half-breed children, as is so frequently found where races mix, a cross-bar or rope stretched across the tent is always on hand, as it gives a support to the patient who kneels in labor; but when this will not advance, the woman is generally drawn over the bar, face down-

ward, the upper part of the stomach resting upon the wood, and several persons, all women, supporting her arms, gently draw and push her over the bar or rope. This, I am told, is the only kind of expression employed among these tribes; an instance of this kind is related to me by Surgeon W. S. King, U. S. A., in which a patient was so drawn over a rope suspended between two trees.



FIG. 2.—Management of difficult labor in Siam.

(4.) *Stripping down the abdomen.* This is only resorted to in desperate cases; but, although not common, seems to be the last resort among various people. I hear of it in Siam, among the Tartars, and among the Coyotero-Apaches; and, remarkably enough, precisely the same method is adopted in each instance. The parturient is suspended by bands

beneath the arms, and one, sometimes two, of the attendants grasp the body of the patient in their arms, and strip down the womb with considerable force; a kind of "all pull together," as Dr. Reed, Surgeon U. S. A., expresses it. He says that this energetic manœuvre generally suffices, as he never heard of a case that resisted this method. That is very likely, as the fetus will find an outlet somewhere, be it *per vias naturales* or through the abdominal walls. The child must out. Other means they have none; hence, it is the best that can be done, although we should think that the mother, if not the child also, must inevitably suffer.

(5.) *Expression by means of the feet.* A very effective and not very delicate method, pursued by experts among some very primitive people, is, in difficult cases where the ordinary methods have not answered, to stand upon the abdomen of the patient, with the heels upon the thorax, the toes pressing upon the uterine fundus, and thus to express the child; or, as among the Negritas of the Philippine Islands, or the Waswaheli, among the Siamese and Burmese, an old woman, who takes the place of the midwife, places her left foot upon the patient's body, pressing upon the fundus, while she drags down the baby with the right hand. A report from Siam (Samuel R. House, M.D., *Archives of Med.*, June, 1879) states that a favorite way to expedite matters is to press with great force on the abdomen and its contents, shampooing vigorously with the thumbs and fists, and even to stand upon the poor woman's body, crowding the heels upon the front or side of the distended uterus, and without the slightest reference to or knowledge of the condition of the os uteri. In Ceram, they place the patient flat upon her stomach to force the expression of the child. The Negritas, also, are fond of placing bricks or stones, but hot, upon the abdomen of the patient to insure expression.

In some few instances, the parturient practises expression herself, either with her own hands, by the tightening of a belt, or by pressing against a fixed body. I have seen but one statement, and that is from the Indians of the Pacific slope, that the parturient uses her own hands to compress and press down the womb. How much more useful than the senseless grasping of bed-clothes or assistants by the civilized lady!

(6.) *The belt.* The belt, which is, of course, the same as the bandage, only that it can be used by the patient herself, is resorted to by some of the more primitive of Russian tribes, and by some of our own Indians, especially the Sioux, and there, more particularly, for the expression of the after-birth. The belt called the squaw belt, a broad leather strap with several buckles, is commonly used; after the delivery of the child, as the patient stands up, her legs apart, she herself draws tight the belt, and thus expresses the after-birth, which readily drops out by sheer force of gravity, assisted by this forcible *vis a tergo*.

(7.) *Pressure against the staff.* The Indians of the Uintah Valley Agency are delivered in a kneeling posture, but as soon as the child is expelled, the patient, who continues to drink freely of hot water, arises to her feet, places a folded cloth on her abdomen, and leaning forward over the stake, some three feet in length, which has served her as a support during labor, she raises her body upon it, thus exerting considerable pressure over the hypochondriac region and favoring the expulsion of the placenta; and it is thus delivered without any further assistance. This practice also exists among the Crows, Creeks, and similar tribes. The Negrita woman, who is unable to allow herself the assistance of the medicine man, presses her abdomen against a bamboo, in order in some measure to replace the expression by the hands of an assistant. The squaw of the Pacific coast, who walks about during the first day after confinement, steps about slowly with a staff, frequently bending the body forward so as to bring the abdominal walls immediately over the region of the uterus against the upper end of the staff, which is protected by the hands of the woman. Thus, the flow of the lochia is facilitated and compression of the uterus furthered.

(8.) *Lying prone upon the stomach upon a pillow.* This peculiar method, so far as I can learn, is practised only by the Creek Indians. The mother straps the pillow tightly to her chest with a belt, lies flat upon her face, and, as the labor proceeds, the strap is buckled tighter and tighter, until the expulsion is accomplished, the pressure being due, not so much to the tightening of the strap as to the pressure of the body upon the uterus, the pillow simply preventing the upward motion of

the fundus. In Ceram, Loango, and other districts of Central Africa, the patient is also placed upon the stomach, if the labor does not progress, and the expulsion of the child is hastened by tramping upon the back of the sufferer, or placing heavy weights upon it.



FIG. 3.—Massage and expression as practised in Mexico.

II. **MASSAGE.** Massage, by which I understand a more complicated manipulation of the abdomen—the *Shampoo* of the Indies; the *Cong-Fou* of the Chinese; the *Ambouk* of the Japanese—serves to correct the position of the child, and to

stimulate the contractility of the uterine muscles, and is used wherever external manipulations are resorted to, almost always in connection with expression. It is used to correct malposition, to produce abortion, to stimulate labor pains, but, above all, for the expression of the after-birth and the prevention of post-partum hemorrhage. These manipulations are usually practised very much in the same manner whatever position the patient assumes; and they serve the same purpose whatever the position of the patient may be—kneeling, squatting, resting in the lap of an assistant, or semi-recumbent—and they are best illustrated by Fig. 3, which is from a photograph taken for me amid great difficulties by my scientific friend, Prof. G. Barroeta, of San Luis Potosi, Mexico.

The patient kneels on the spread (B) prepared for her; this consists of a sheep-skin (S) covered with a cotton blanket (C) and a zarape (Z). Upon one end of this is put a cushion (H), upon which the patient places her head when she assumes the recumbent posture after delivery. The position of the parturient is upon her knees, supporting herself by the cord or lasso (L), which is suspended from the beam (W). Two assistants perform the customary manipulations. The *partera*, the more experienced and older of the two assistants, kneels before the sufferer; it is her business to manipulate the uterus, pressing and rubbing the fundus, at times placing one hand on the vulva, and preparing the coccyx. The younger, the *tenedora*, kneels behind the patient, pressing her knees upon her hips, and clasping the hands over her stomach, thus exercising pressure by the encircling arms, whilst the more experienced *partera* practises massage. (Dr. Kellog.) The *tenedora* assumes more active duties in difficult cases, either in retarded labor or retained placenta. She then raises the patient by her arms, shakes her as she would a sack, and lets her fall, partially catching her as she drops, with a shock and sudden compression of the abdomen whilst the parts are being kneaded. Although the methods are very much the same among all people and in all positions, slight differences are here and there observed; for instance, among the Papagos, one of the assistants places herself in a kneeling posture behind the patient, with one knee pressing upon the lumbar region, while she grasps the body of the sufferer with both

hands immediately under the ribs in front. The other assistant places herself in a kneeling position in front of the patient, and with the palms of her hands rubs the abdomen thoroughly, the pressure being constantly exercised downwards from the spine of the ilium to the pubis. They appreciate the difference between primipara and multipara, and with the former they do not resort to the same degree of pressure and friction as in the multipara, being evidently aware of the more firm tone of the abdominal muscles, and of the longer time needed. In Africa and in India, we find not unfrequently that warmth and oil aid in this process, as among the Gros-Ventres, where the assistant greases her hands with turtle fat and warms them over the hot embers, and quickly applying the heated hands to the patient's abdomen, rubs and presses it downward and backward. These manipulations are, of course, more readily practised with the patient in a kneeling or squatting position, and especially when seated semi-recumbent in the lap of an assistant, whose encircling arms afford the means of compression. But with the necessary variations, it is the same whatever position the patient assumes. For instance, among the Hoopa, Klamath, or Penemone Indians, the patient lies down in a semi-recumbent position, whilst an assistant kneels at either side, rubbing and pressing the abdomen. So, also, among the Siamese, where the patient is on her back, a woman takes position on either side, and they begin by forcibly pressing the abdomen backward and down for three to five hours, and, if then they fail to expel the fetus, one tramps upon the abdomen, and, as we have learned, if this does not succeed, the more forcible method of suspension is resorted to. Instead of the hands, the thumbs and fists are used by some. For instance, as in Siam, where they shampoo the abdomen vigorously in this method, stroking and pressing it downward at the same time. Among some people I find no reference to the use of massage, but have considered this more as an omission upon the part of my informants. For instance, among the Chippewas and Blackfeet, lower and upper Yanktonais, nothing is said of the use of massage by my correspondent. So, also, among the Santees and Dakotas, the Cherokees, Choctaws, Chicasaws, Seminoles, Cheyennes, Arapahoes, Assiniboines. It is, however, an almost universal agent, and, whether

among our own Indians, the Mexicans, or natives of South America, the Vedas of India, the ancient Ainos, or the modern Japanese, the inhabitants of the Caucasus, or of the Himalayas, of the Australian Islands, or of Africa, we find that massage is everywhere the main and almost the only reliance in labor.

III. SHAKING UP OF THE PATIENT.—Though not strictly within the sphere of this paper, I will briefly refer to some of those peculiar and barbarous methods to which these primitive people resort in their despair. We have already observed how, in Mexico, the *tenedora* raises the patient up and drops her, catching her with a shock so as to shake out the uterine contents, shaking out the child from the womb as she would flour out of a sack. In Southern India, they shake her several times to promote delivery, but, if this does not answer, they roll the patient upon the ground, or suspend her by her feet and shake her several times. The object of this is, evidently, after they have seen that the child cannot be expelled in the natural way, to throw the fetus out of the pelvis proper into the roomier upper portion, so that it may change its position, and come with head or breech first. We find a precisely similar custom among the Nez-Perçés Indians, who take the patient, if labor is prolonged, reverse her, and whilst the head rests upon the ground, shake the body vigorously in the air; then they lead her to a stake again and see if the condition of affairs is at all improved; if not, the process is again repeated. This they do several times, and, if finally it proves of no avail, the midwife introduces her hand, and pulls at whatever she can reach. If it happens to be a foot, well and good; if it happens to be an arm, the patient will probably be so injured that death results, as my correspondent tells me he has never heard of a woman surviving the graver accidents of parturition. The Esthonians hold the patient in the air, shaking her vigorously if labor is retarded. In Syria, the patient is rolled in a blanket if she is not confined within twenty-four hours after the commencement of labor, and four male or female friends seize the corners of the blanket and roll the poor woman about in various directions, and bounce her up and down to facilitate confinement.

IV. PERMANENT PRESSURE.—Bandages of cloth or leather ropes or belts, are occasionally resorted to, but are not found as

often as in the lying-in room of civilization. They are used here and there in pregnancy, labor, and child-bed. In pregnancy, the binder is used in Japan from about the fifth month on to prevent the growth of the child, so that it may not become too large, and delivery may be easy. In India and in Burmah, as well as among one or two of our own Indian tribes, the bandage is used, tightly worn, after the seventh month, in order that the uterus may not ascend too high, that the child may not have so far to go when it wishes to escape. In labor, the simple binder is rarely resorted to. Usually when the binder is applied, it serves as an active means of compression; but among one of the Indian tribes, as we have seen, the simple belt is used, which is pressed down so as to follow the uterus with each pain. In child-bed, or rather in the time following delivery, as the bed is but rarely resorted to, the binder plays a very insignificant part. We have seen, especially among the Sioux, the squaw belt used, but it is worn for only, perhaps, twelve hours after labor. In Mexico, a tight bandage is sometimes used, or a rope. In Old Calabar, a simple handkerchief answers the purpose. The Kiowas, Comanches, and several other Indian tribes use it; but whether travellers or other authorities who have written upon the subject neglected to mention the binder or not, I rarely hear of it.

D. THE USES OF MASSAGE AND EXPRESSION.

In speaking of the different kinds of external manipulations and the various methods of applying them, we have naturally spoken to some extent of the purposes for which they are used. But it may be well to consider these somewhat more in detail, and I will endeavor to describe the various purposes served by these external manipulations in pregnancy, labor, and in child-birth.

I. PREGNANCY.—Steady pressure, as we have seen, is used to prevent the undue growth of the ovum; but massage properly is resorted to for the purpose (1) of *correcting malpositions*. Thus, in Japan, the medicine-man manipulates the abdomen of the patient, who clings about his neck, pressing his shoulders against her breasts, and pressing his knees between hers, so that she is firmly supported. Then he practises a lateral massage with his hands, beginning at the seventh cervical vertebra, and rubbing downward and forward, rubbing also the nates and

hips with the palms of his hands, repeating the movement from sixty to seventy times every morning after the fifth month. This, I judge, is only in case of wealthy or handsome patients, or when malpositions are expected for certain superstitious reasons. By far more frequently is massage used for the purpose (2) of producing *abortion*. Among some of our own Indians, the Pintes among others, many of the natives of Australia, the inhabitants of the Sierra Leone, and of the interior of Africa, the Loango negroes, and others, produce abortion, either by firmly kneading and rubbing the abdomen with the hands, or pounding and working it with their fists. Many do it for criminal purposes; others because they dread the often fatal labor with half-breed children. This is a somewhat remarkable circumstance, but true among our own Indians upon the Pacific Coast and in the interior, in Australia, and in India, that labor following intercourse with whites is always tedious and dangerous, frequently ending in the death of both mother and child. Hence they produce abortion in preference to undergoing this ordeal. In India and in Africa, abortion is often produced when the mother is suckling one infant and finds herself pregnant with another.

II. LABOR.—Massage in (1) *normal labor* is almost invariably used unless the case be a very simple and rapid one, or the poor sufferer be without friends and means. It serves the purpose of improving or correcting the position of the child, of stimulating the uterine contractions, and of directly aiding by mechanical pressure the muscular action. A slight variation, ordinary flexion and pressure upon the abdomen, regular massage, combined with expression, is used in ordinary cases.

(2.) *Malposition*.—In cases of malposition, which are only discovered by the simple fact that the child is not expelled in proper time, more violent means are resorted to, such as forcible kneading, shaking, tossing in a blanket, and tramping upon the abdomen. Thus, by violent means, there is a possibility of forcing the child into its proper axis, with breech or head in the pelvis, and this done, of forcing it out through the natural passages. These external manipulations are, as we have seen, their only resort; and as death is the consequence of an undelivered child, every means in their power must be taken to expel it; and these very forcible means must almost

inevitably force a rupture somewhere. If the child is not crowded out through the natural outlet, a place of least resistance will be found elsewhere; the womb or abdominal walls must give way. The child must out or the patient must die.

(3.) *Placenta.* The placenta usually follows the child, but unless this is the case, massage and expression are invariably resorted to. Frequently the patient retains the same position which she assumed during labor, and the attendants continue the same manipulations until the after-birth is expelled. Rarely does she assume a different position, as among the Sioux, where the squaw belt is used, the parturient jumps up after the delivery of the child, draws tight her belt, and thus forces out the placenta. Then, again, others press with the abdomen against a staff fast in the ground. In short, the milder means of massage and expression are used in this stage of labor by the various people. It may be again remarked that primitive people, odd as it may seem, rarely pull upon the cord, but in most instances use the *vis a tergo*, stimulate the activity of the womb by friction of the fundus, and press out the contents. Massage, combined with expression of various kinds, never very forcible, is used in this stage of labor.

III. CHILD-BED. I have not found any reference to the use of massage after the expulsion of the placenta. Expression, of course, does not come in question; but permanent pressure, as we have already seen, is occasionally used. I will not here again refer to it, as being really foreign to our subject. In some few instances, as among certain tribes upon the Pacific coast, some pressure is at times exercised upon the abdomen during the first day after confinement, the patient walking about, occasionally stops to lean with the abdomen upon a staff, and the compression of the uterus forces out the discharge. Among some of the Indian tribes, but especially among the natives of Africa and India, the infant is thoroughly kneaded and massaged after each bath; and this very excellent procedure undoubtedly serves to strengthen the tender muscles.

E. THE DEVELOPMENT OF EXTERNAL MANIPULATION IN RECENT OBSTETRIC PRACTICE.

The use of external manipulation in child-birth is, as we have seen, a most ancient and venerable practice, forgotten by

civilization for ages, and only of late years again accorded the importance which simple-minded, primitive people have always conceded to it.

Phélippeaux, in his "*Etude Pratique sur les Frictions et le Massage*," Paris, 1870, justly says: Within a few years, in the presence of numerous well-authenticated and, we may almost say, marvellous facts, a return has been brought about to a legitimate and long-forgotten practice. To-day the most illustrious masters look kindly upon a method of treatment as old as the world, which has now been deprived of the surrounding fables and charlatanism. The use of external manipulations in obstetric practice has rapidly advanced in importance in the course of this century. In 1812, Wigand discovered the important fact that, by the aid of external pressure, malpositions could be corrected; but his views, although addressed to the academies of Berlin and Paris, were neglected and forgotten: yet he had only stated distinctly what Hippocrates had vaguely indicated, and what Jacob Rueffius and Mercurius Scipio had urged. The Hamburg obstetrician was forgotten until 1859, when the translation of his work by Belin and Herigott appeared in Strasburg. This was taken up by Stoltz and Cazeaux. Then comes Wright, of Cincinnati, and, soon after, Braxton Hicks, to whom the credit has so long been unjustly given; and in 1853 and in 1860, Credé, who so earnestly advocated delivery by means of expression, endeavoring to imitate nature as nearly as possible by provoking uterine contractions, forcing the descent by a *vis a tergo*, the hand never touching the genitals of the patient, the entry of air, as well as traumatism, were impossible. Credé's method was already indicated by Busch in 1803. Then, in 1867, comes Kristeller, advocating uterine expression for the delivery of the child itself; and, in 1865, Martin, of Berlin, attempted to obtain the after-coming head by means of manual expression after the delivery of the body. Although Credé's method is so perfectly natural, simple in principle, and easy in application, it has yet but slowly asserted itself. Even in Germany, among his immediate surroundings, it was a long time before the method gained ground. (*L'Expression Utérine*, A. T. Suchard, Paris, 1872.) In 1856, von Ritgen urged that the forceps should never be used without the accompanying aid of manual expression, and

Seyfert, of Prague, pointed out the merits of these methods at every possible opportunity, on account of his great aversion to all such methods of delivery which necessitated the introduction of hand or instrument into the genital tract. He sought to obtain the delivery of the uterine contents as does nature herself, by pressure from above, not by traction from below.

Massage and expression being the only resort in the hands of primitive people for the completion of difficult labor, they intuitively, by instinct and by long practice, not by scientific reasoning, of course, have brought them to a certain state of perfection, although brute force is more relied upon than dexterous manipulation. The methods are so simple, so natural, and so thoroughly in accordance with sound mechanical principles, that they have produced good results. Deprived of the brutality of physical force and aided by science, these very means which have so long and so well served the ignorant will attain a high degree of perfection, and will serve by far better the scientific obstetrician.

LITERATURE.

I have not here referred to my authorities, as I have, in my earlier papers, given due credit to the numerous professional brethren who have so kindly and so indefatigably aided me in my work. I have compiled the facts here given from the same data; *i. e.*, information gathered from individual friends, from the letters received from the Surgeons of the U. S. A., and from the Agency Physicians in response to the circular letter of inquiry, sent by Major Powell, of the Bureau of Ethnology of the Smithsonian Institution; from medical works and the reports of travellers, especially the *Zeitschrift für Ethnologie*, and the following books and papers, bearing more particularly upon massage. From the first three I have drawn largely; of the last three I have only seen extracts.

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A CASE OF SUCCESSFUL OVARIOTOMY IN A CHILD.

BY

W. J. CHENOWETH, M.D.,
Decatur, Ill.

BELIEVING that the following is an uncommon case, I offer it for publication.

March 7th, 1882, my son, Dr. C. Chenoweth, and I were called to see Dora Timmons, living near Niantic, seven years and eight months old (born July 9th, 1874). When first seen, she was lying in a half-erect posture, on her left side; face and upper extremities greatly emaciated, abdomen enormously enlarged, measuring at its greatest circumference forty and one-half inches—abdominal veins prominent, lower extremities swollen, anxious expression of countenance, frequent cough with ropy, tenacious expectoration and dyspnea. Not a single symptom offered hope. About the first of last September, while the child was suffering from diarrhœa, her mother had discovered “a lump in her right side.” Dr. Clark, of Niantic, who was called to treat her, found a movable tumor occupying her right side “from the groin to the umbilicus,” the character of which he did not determine. About the middle of December, her abdomen became much enlarged and her feet edematous. She was now seen by other physicians, none of whom gave her any encouragement—opinions expressed by all of them being vague and unsatisfactory—one thought that it was malignant, or tuberculous, probably enlargement of the mesenteric

glands. But it was generally agreed that surgical interference was not justifiable. Since about the first of January, she has been compelled to sit up the greater part of the time, day and night, and when she ventured to lie down it was necessary to turn her from side to side every few minutes.

There was a large accumulation of dropsical fluid in the abdomen, seven pints of which we removed with an aspirator, before we could examine the tumor, which we found to be a dense, resisting nodulated body filling the abdomen and pelvis, so that it was with difficulty that we could insinuate the fingers between it and the ribs, and rendering it impossible to crowd them into the pelvic cavity.

From the size of the tumor, the history of its growth, and its evident connection with the pelvic organs, we supposed it to be ovarian, and that an attempt at its removal was demanded.

Placing her under chloroform, an incision was made along the linea alba, which it became necessary to extend from the pubes to the sternum, and the tumor was turned out with much difficulty, not only on account of its great size, but because of numerous attachments, by long fleshy bands, to the omentum and sides of the abdominal walls. The pedicle, which was found to proceed from the right ovary and quite small, was secured by a single ligature. The incision was closed with thirteen silk sutures, the ligature surrounding the pedicle brought out at the lower part of the wound, compresses, previously saturated with carbolyzed water, laid over the abdomen, over these carbolyzed cotton-wool, then strips of rubber adhesive plaster, and over all an ordinary binder. The child was now wrapped in hot blankets and placed in bed. The operation was concluded in thirty minutes. Reaction was established in about an hour. At 6 P.M. Dr. Clark, who had assisted during the operation, removed about twelve ounces of urine. The bladder was again emptied during the night. No urine was secreted after this, for about forty-eight hours, the face and hands becoming edematous. The suppression once relieved did not recur, although the only effort made to prevent it was by keeping the body warm. Sudden tympanites, lasting for about twenty-four hours, gave some uneasiness during the fourth week; with this exception convalescence was rapid and continuous. Her appetite was good from the day after the operation, and she was, apparently, entirely well in one month.

I saw her several times, but Dr. Clark had charge of the case subsequent to the operation.

The tumor was composed of numerous cysts containing a thick albuminoid substance, the walls dense, and cysts easily torn apart without emptying their contents. It weighed sixteen and one-half pounds and filled an ordinary wooden water bucket.

The following are all of the cases of ovarian tumors occurring in children under puberty, reported in the medical literature at my command.

NO.	NAME OF OPERATOR OR REPORTER.	AGE.	DATE OF OPERATION OR REPORT	DISPOSAL OF CASE.	RESULT.	SOURCE OF INFORMATION.	REMARKS.
1	Koeberlé, Strassburg	13	Sept. 1, 1873.	Operation.....	Recovered	Abstract of Medical Sciences, April, 1876.	The catamenia had appeared 3 months previously. Koeberlé had operated on three girls nearly fifteen years old.
2	Koeberlé	11	Do.	No operation..	Died	Do.	Tumor was sent to Dr. Thomas from a physician in New Jersey. It was noticed when the child was one month old. It grew until it destroyed life.
3	Spencer Wells ...	8	Jan. 5, 1874.	Operation.....	Recovered	New York Medical Journ., Dec., 1874	
4	Prof. McGraw, Detroit, Mich.	12	Sept. 12, 1876.	"	"	Richmond & Louisville Med. & Surg. Journal.	
5	Dr. T. G. Thomas...	3 yrs. 5 mos.	Oct. 7, 1879.	No operation..	Died	Am. Journ. Obstet., Jan., 1880.	Case reported to Obstet. Soc. N. Y. six years ago by Dr. Pooley, of Yonkers. Child died from peritonitis by bursting of the cyst.
6	Dr. J. Foster Jenkins	3 yrs. 4 mos.	.....	"	" .....	Do.	
7	Dr. Schwartz.....	4	Sept. —, 1876.	Operation.....	Recovered	Am. Journ. Obstet., Jan., 1879.	
8	Dr. Geo. Cupples, San Antonio, Texas.	7 yrs. 6 mos.	July 26, 1874.	"	"	Rich. & Louisville M. & S. J., Dec., 1874.	Double ovariectomy. This and the eight cases following were collected and added to report of the preceding case by Dr. Cupples.
9	Dr. Thomas Bryant, Guy's Hospital, London.	14	July —, 1869.	"	"	Do.	
10	Mr. Jessup, Leeds General Hospital.	13	Dec. —, 1871.	"	"	Do.	
11	Dr. J. Van der Hoeven, Holland.	13	June —, 1874.	" ...	Died	Do.	

12	Prof. Jean, School of Medicine, Nantes, France.	12	Jan. — 1871.	Operation . . .	Recovered	Rich. & Louisville M. & S. J., Dec., 1874.	Case mistaken for one of hydatids of the liver; abdomen opened by caustics; discovery of a multilocular tumor; ovariectomy; recovery in forty-six days.
13	Mr. Alcock, N. Stafford Infirmary, Eng.	2	1872.	"	Died	Do.	The date of this case supplied from Peaslee's Ovariectomy.
14	Dr. W. B. Barker, Higginsport, Ohio.	6 yrs. 8 mos.	1871.	"	Recovered	Do.	Name of operator supplied from Peaslee.
15	....	6 yrs. 8 mos.	1871.	"	"	Do.	Statement made in European continental journals; also in Medical Press and Circular, March, 1873.
16	Dr. G. C. Goodrich, Minneapolis, Minn.	8	1873.	Tapped	Died after 3d tapping	Do.	
17	Dr. Dickenson, Liverpool.	10	1874.	No operation.	Died	Do.	
18	T. A. Emmet	10	1880.	"	"	Am. Journ. Obstet., July, 1881.	
19	Dr. Busch, Bonn.	2		Operation	"		Case mentioned at meeting of Obstetrical Society of New York, Dec. 7th, 1880. Malignant tumor of ovary, probably weighing fifty pounds, had been developed since last May.
20	Dr. W. J. Chenoweth, Decatur, Ill.	8	1877.	"	"	Not before reported, except to Decatur Medical Society.	Tumor was an encysted of right ovary. Death occurred forty-eight hours after operation.
21	Dr. Paul F. Mundé.	14	1877.	Electrolysis—ovariotomy.	Recovered	Trans. Am. Gyn. Soc., Vol. II., 1877.	Never menstruated. Electrolyzed internally by Dr. Mundé. Afterward operated at Woman's Hosp. by Dr. T. G. Thomas. Dermoid tumor.
22	Dr. Paul F. Mundé.	18	April 1882.	Not yet operated.	....	Met. in consultation with Dr. J. Taber Johnson, Washington, D. C.	First noticed enlargement at fourteen; never menstruated. Large, probably bony, plate felt through abdominal wall. Probably dermoid tumor.
23	Dr. T. G. Thomas.	12	May 1882.	Do.	....	Communicated by Dr. Mundé.	Never unwell.

¹ The last two cases have not appeared in medical literature.

A CASE OF PLACENTA PREVIA WITH DOUBLE PLACENTA.

BY

PAUL F. MUNDE, M.D.

I WAS recently asked by Dr. Charles Milne to see a patient with him, of whom he gave me the following history :

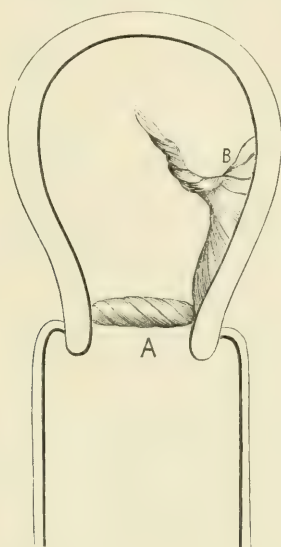
“ On Monday evening, March 6th, 1882, he was hastily called to see a lady who had engaged him for her confinement. He found her in labor with her third child at term, and lying in a pool of blood, which had suddenly gushed from the vagina. An examination revealed the os barely dilated to the size of a twenty-five-cent piece, and the internal os completely closed by a mass which corresponded in feel to the placenta. The head presented above this mass, as could be felt by palpation above the pubis, the child being in the L. O. A. position. The fetal heart could not be detected, and no motions of the child were perceptible. The woman had lost so much blood that she was quite blanched, and on the verge of syncope. No efforts were therefore made to dilate the os and at once complete delivery, but the vagina was securely tamponed with carbolized cotton, and the hemorrhage was arrested and did not return. With the assistance of Dr. A. Mayer, the tampons were renewed twice daily, and a few drachms of ergot given to arouse the entirely dormant uterine contractions; but in vain. As the result of the tamponade, the os very slowly dilated, until on Friday, 10th, it was about two inches in diameter, and the cervix soft and dilatable. Dr. Milne then thought it feasible to complete the delivery, and requested me to see the case and operate, if it was so decided. I saw the patient on Friday at 2 P.M., removed the tampon, and found the external os as stated, and completely covering the internal os and dipping down into the cervical canal a large spongy body, evidently the placenta, firmly adherent all around. Through the placenta I could feel a solid round body, the presenting head. No heart-sounds were audible, and the patient stated that no fetal movements had been felt since the hemorrhage on Monday. It was evident that the child was dead, killed either by the loss of placental blood on Monday night, or, what seemed more probable, by the compression of the placenta between the presenting head and the brim of the pelvis. The woman's strength appeared good. Bad features were a pulse of 120 beats and a temperature of 102°. Labor pains were entirely wanting.

There was nothing to be gained, and much to be lost, by waiting; the patient's febrile condition certainly demanded a speedy completion of the labor. The cervical canal was sufficiently dilated or dilatable for the passage of the hand into the uterine cavity,

and there was but one way in which delivery could be at once and easily accomplished, viz., by detaching the presenting placenta, turning the child by the feet, and extracting it. Being unquestionably dead, its welfare was not to be considered. This was accordingly done. As I had been already told by Dr. Milne, and as my first examination confirmed, I found the placenta wholly and firmly adherent to the uterine circumference of the internal os. Passing my hand (the left) between placenta and uterine wall on the right side, I with a few sweeps, rapidly peeled off the placenta, causing comparatively slight hemorrhage, and proceeding into the uterine cavity, seized a foot, turned, and easily extracted the child. Immediately after the head followed the placenta. The child had evidently been dead several days, as the epidermis of its leg was stripped off during extraction. I now proceeded to remove the child and placenta from the bed to a basin, when, to my surprise I saw that the umbilical cord, which I, of course, supposed attached to the expelled placenta, still led into the vagina. Introducing my hand, I felt a second placenta lying loose in the cervical cavity and removed it."

On examining and comparing the two placenta, I found them both slightly smaller in diameter than usual, and decidedly thinner, especially the one first expelled, which was entirely separated from the membranes, and on its uterine surface showed several marked fissures and extravasations of blood, particularly at one spot near its border, whence evidently the first profuse hemorrhage had come. The second placenta was slightly larger than the first; the membranes were attached to it on one side only, having evidently been torn from the remaining border; the cord was inserted near the middle, and presented no special ramification of its vessels on the fetal surface of the placenta. The margin opposite to the spot where the membranes still adhered presented a particularly ragged appearance, and the border opposite the fissured spot on the first placenta had a similar aspect. There was no cord attached to placenta A, and no large blood-vessel to be detected running to it from placenta B. As I had occasion to notice the absence of a placenta on the right uterine wall during the introduction of my left hand for version, I could find no other explanation for this peculiar duplication of the placenta and for the respective relation of the two parts to the endometrium and the internal os than the following: Either there was originally one large placenta, one-half of which covered the internal os, which large placenta became separated into two by atrophy of chorion villi at one

spot at a very early stage of its development, or, what is perhaps more probable, when we remember that the cord was inserted almost in the centre of placenta B, the placenta was originally developed in two patches of chorion villi, into but one of which (placenta B) the allantois vessels extended. The other patch then developed into what is known as a placenta succenturiata. This latter was evidently the previa, since not only did it come away first, having been wholly detached by my hand on proceeding to turn, but showing also the distinct marks of sugillation, fissures, and peripheral border of separation from its attachment all around the lower segment of the



uterus. Placenta B with the cord must have been attached to the left lateral wall of the uterus, since I know it was not on the right side. The relations of the organs, as I have thus formulated it, is shown in the accompanying diagram. That there may have been some vascular connection between the two placentæ is possible, although not imperative to explain the hemorrhage, which came from the torn uterine vessels, rather than from the placenta. What caused the death of the child is, then, however, not so clear, since the child was not nourished through placenta A, and the compression of the latter by the fetal head could not, therefore, interfere with the

blood-supply of the fetus; neither could the hemorrhage from A kill the child by direct anemia. It is possible that the shock of the hemorrhage to the mother may have been the cause of death of the child. One thing is certain, that the compression of placenta A by the fetal head arrested the hemorrhage, and for the time being saved the life of the mother. Possibly the head may at the same time have sufficiently compressed placenta B to kill the child.

Of the seven cases of placenta previa which I have attended (I have since seen an eighth in consultation for septic puerperal endometritis, also central and version), this was the first one with central implantation, and never had I seen an instance of so well marked double placenta. Small placenta succenturiatæ, of the size of a silver dollar, I had seen several times, also one case of velamentous distribution of the vessels of the cord over the membranes, one artery being ruptured by the advancing head. While I expressed the opinion to the attending physicians that this double placenta was due either to partial atrophy or to an isolated development of chorion villi, I had no distinct recollection of the connection of such an anomaly with placenta previa. On looking over the literature, however, I found that a number of cases of placenta previa are on record in which the placenta was separated into two or three lobes (Busch, McClintock, Schuchardt), or two separate halves (Grenser, Küneke), or had numerous deep furrows (Depaul). In other cases, it had the shape of a horseshoe (Kuhn), a heart (Roper), a pear (Lachapelle), semilunar (Schmidt), annular, the centre being ligamentous (Kuhn). In Küneke's case, the secondary placenta, precisely as in the present instance, was the previa, and both placenta were united only by non-vascular connection of thickened membranes 2 cm. wide and 1'' thick. The explanation of this comparative frequency of placental anomaly in cases of presenting placenta is to be sought in the less favorable conditions for nidation and growth of the chorion villi in the lower segment of the uterus, where the uterine mucous membrane is naturally less vascular and less suited for nutrition of the ovum. In consequence, the placenta in previa cases is generally much thinner than when it is attached further up in the uterine cavity, and in compensation extends over a much larger area. This was the case in the present instance, both

placentæ together forming a surface at least 12" long by 6" wide. Braxton Hicks, Barnes, Hegar, Sirelius, Jüdel, and others mention cases in which the placenta was attached to nearly the whole surface of the uterine cavity. This thinness of the placenta explains the possibility of forcing the hand through it and extracting the child through the rent (as advocated by Simpson), and of the spontaneous birth of the child through such an attenuated semi-ligamentous spot (cases of Hegar and Hyatt).

Cases of the kind here reported are certainly rare enough to merit special attention, that of Küneke being the only precisely similar one on record, and a knowledge of the occurrence of this peculiar anomaly in placenta previa may at times be of great practical value.

AMERICAN OVARIOTOMIES.

BY

HORATIO R. BIGELOW, M.D.,

Washington, D. C.

(Concluded from April Number.)

Cases of DR. J. E. JANVRIN, New York.

Dr. Janvrin reports one case as follows:

Unmarried; 28 years old; performed in March, 1878. The tumor, a polycyst of right ovary, with really no distinct pedicle, the sac being strongly adherent to the whole right side of the uterus. A small portion of the sac was left, the walls of the sac being closed into the abdominal incision, and treated by clamp; a drainage-tube first being introduced into the sac, to permit disinfecting and washing it out. Complete recovery took place, the small portion of the sac coalescing, and at end of six weeks, patient returned to her home in the country. Listerism used during operation.

Cases of DR. W. H. BAKER, Boston, Mass.

I have done ten abdominal ovariectomies, with three resulting successfully; two vaginal ovariectomies, one successfully;

and two oöphorectomies (Battey's operations) quite recently, both successfully.

Cases of DR. B. F. DAWSON, *New York.*

Number of operations. 5.

Married. 4.

Ages. 23, 37, 39, 41, 50.

Nature of tumor. 3 monocysts. 1 multilocular colloid cyst. 1 (Battey's operation) both ovaries affected with slight cystic degeneration.

Anesthetic. 1 bichloride of methylene. 4 sulph. ether.

Listerism. 3 cases.

Clamp or ligature. Clamp applied in three cases. Silk ligature in one.

Adhesions. Slight in one case. Extensive and firm in one.

Incision. Not over five inches in three cases. Up to umbilicus in 2.

Results. 4 recoveries. 1 death.

Remarks. The fatal case was a desperate one, and patient only lived six hours. Monocyst, purulent contents, adhesions so dense as to make removal of all the tumor impossible without danger to the pelvic viscera. Patient was suffering with septicemia before operation, and death was hastened by shock. Dr. T. G. Thomas and others concurred in propriety of operating. Of the other four cases, one was more properly, as stated, Battey's operation, but, as both ovaries were found undergoing cystic degeneration, I have classed it as coming under your interrogations. In this case, both pedicles were tied, and stumps cauterized. The cases in which the pedicles were clamped in the wound, were so treated with my own instrument. My last case was on last Thanksgiving day, and although I purposed to operate under carbolic spray, the apparatus did not work, but the most careful attention was paid to cleanliness, etc., even the oozing from the abdominal incision being kept from the peritoneal cavity by napkins placed over the edges, and even when the stitches were taken, a flat sponge placed over intestines to catch the same, and the drops of blood from the under punctures. These precautions I have always taken, and two of the best recoveries were with-

out Listerism in any form. I place more value upon extreme cleanliness as regards blood or fluid entering peritoneal cavity and the complete expulsion of air on closing the wound, than I do upon the carbolic spray.

Cases of DR. M. M. LATTA, Goshen, Ind.

As I never made any pretensions as an ovariectomist, I have kept no record of my cases. Inclosed I send an account of all I recollect, but have to depend on my memory for facts, and in some instances even for dates. I use chloroform preceded by some opiate and a moderate stimulant. Of late years, I add five or six drops of nitrite of amyl to each measure of chloroform, that quantity being sufficient to counteract any unfavorable effect of the chloroform. In my last two cases, I tried laying the patients on rubber bags filled with hot water (after Dr. Noeggerath), and am so pleased with the result that I shall continue the practice. No special treatment in any of these cases, some of them being entire strangers up to the day of operation. My first operation must have been one of the first in the State. It was done in an open cabin on a cold October day, and the woman died in three hours, probably as much from exposure as anything else, though the case was a desperate one. Have used the Lister method to some extent, but will abandon it. Water boiled and strained so as to be free from impurities, will be depended on hereafter. The large tumors were carefully weighed, but the small ones were not. I give the estimate at the time of operation. Although not in the line of your inquiry, I follow the example of others in reporting four (4) cases of amputation of the uterus with two (2) deaths. The survivors are in good health after three years or longer. . . .

Cases of Dr. LATTA.

No.	DATE.	AGE.	ADHESIONS.	TREATMENT OF PEDICLE.	WEIGHT OF TUMOR.	RESULT.	REMARKS.
1	Oct. 1856.	46	Almost universal.	No pedicle; uterus in a cheesy condition. Pedicle drawn out by a needle.	56 lbs.	Death in three hours after operation. Recovered.	Tumor multilocular. Investing sac very strong. Abdominal incision. Married.
2	Nov. 25, 1870.	20	Considerable.	Pedicle drawn out by a needle. Very long and slender. Stitched into external wound.	61½ lbs.	Died in 24 hrs.	Single sac. Good recovery. Married and mother of 5 children. Last twins. Tapped three times.
3	Apr. 9, 1871.	39	None	Pedicle vascular; used needle and tied behind it. Pedicle very tender. Brought out for fear of bleeding.	18 lbs. estimated.	Recovered	Colloid tumor. Tapped once. Married. Died of shock.
4	May, 1871.	56	None	Pedicle vascular; used needle and tied behind it. Pedicle very tender. Brought out for fear of bleeding.	2 lbs.	Recovered	Tumor removed on account of its painful character. Disease reappeared in 4 mos., and woman died. It was evidently malignant from the first. The operation was not finished.
5	Aug. 24, 1880.	4	Universal.	Pedicle very tender. Brought out for fear of bleeding.	6 lbs.	Died in 24 hrs.	Multilocular. Sac walls very thick, but tender. Thought to be sarcomatous. Married; large family. Health remains good.
6	May 1, 1881.	62	Moderate in front.	Pedicle tied with silk and dropped back.	15 lbs. estimated.	Recovery.	Simple large cyst. Married; one child. In good health now.
7	Oct. 23, 1881.	62	Extensive in front.	Pedicle so tender could not be tied safely; enucleated	63 lbs.	Recovery.	The front of the sac had been partially destroyed. Content like "quince jelly." Part of sac left behind. Married. Supposed to have died of shock.
8	Feb. 31, 1882.	47	Universal.		15 lbs. estimated.	Died in about 48 hrs.	

Cases of DR. J. C. REEVE, Dayton, Ohio.

In answer to your inquiries, I send brief particulars of nine cases of ovariectomy, as follows:

No.	AGE.	CONDI- TION.	NUMBER OF CHILDREN.	WEIGHT OF TUMOR.	MEASURE AROUND ABDOMEN.	PEDICLE.	ADHESIONS.	RESULT.
1	18.	S...	0.....	25 lbs.....	....	Tied; ligatures brought out.	To front and right side of abdomen; not firm.	Recovery.
2	51.	M..	3.....	22 lbs.....	....	None; the pelvic attachments tied in three portions; ligatures brought out.	To liver, small intestines, uterus, abdominal and pelvic walls; some very firm.	Died.
3	55.	S...	0.....	....	41 inches..	Tied and pocketed.....	To abdominal walls in front; one small portion very firm.	Recovery.
4	43.	M..	0.....	....	38 inches.	Sprang from fundus of uterus; about one and one-half inches in diameter.	None.....	Died.
5	36.	M..	8.....	36 lbs.....	....	Tied, and ligatures brought out.	All over front of tumor not firm; firm in left side of pelvis.	Recovery.
6	30.	M..	2.....	....	34 inches..	Same; drainage tube...	Extensive and firm; to small intestines and to omentum; two pieces of latter ligated and cut away. Six or eight gut ligatures put on bleeding points and cut short.	Recovery; ventral hernia.
7	36.	M..	4.....	....	35 inches..	Small and long; tied and dropped in.	None.....	Died.
8	15½	S...	0..	36 lbs..	....	Short and thick; tied; ligatures brought out.	None.....	Recovery.
9	37.	M..	3.....	....	35 inches..	About five inches broad; central portion separated; two extremities tied; pocketed.	None.....	Recovery.

The following additional comments are necessary to complete the reports:

In Case 2, the fluid was limpid and clear, and there was but a single cyst. I strongly recommended tapping, but it was rejected. The thin walls of the cyst and free fluctuation fully justified, in my opinion, a reasonable expectation of a cure by this means. I have since had such a cure, and in a debate at the American Gynecological Society in New York last September, I advocated this measure in all cases presenting such features. I have been gratified to find myself sustained by so high authority as Mr. Keith.¹

Case 4 was one of fibro-cystic tumor of the uterus. It was very friable, broke down under slight handling, and there was much hemorrhage in consequence. In regard to differential diagnosis, it taught the lesson that rate of growth cannot be depended upon to distinguish these cases from ovarian tumors. It had entirely grown within a year.

In Case 5 both ovaries were removed. This case and Case 8 were each tapped once.

All were multilocular ovarian cysts except 2, a single cyst probably of broad ligament, and 4, a fibro-cystic tumor of uterus.

Preliminary treatment in all was the administration of moderate doses of quinine, strychnine, and muriated tincture of iron for about a week, daily warm bathing, with attention to bowels. About three days before operating, the patients were placed on absolute diet of milk, eggs, rice, toast, etc.

The anesthetic used in all cases was the A. C. E. mixture. About twenty minutes before its administration, the patients received a hypodermic injection of ten minims of Magendie's solution, containing one-half a grain of atropia to the ounce. It will require a large amount of testimony to cause me to change either of these measures.

The after-treatment was in all cases perfect rest and quiet, morphia as required, nothing but brandy and water, or cold water, by the single spoonful for the first twenty-four hours; afterwards, milk porridge or plain soup, in like manner, gradually increasing the amount given at a time.

As to antisepsis: There was a break of five years between

¹ Amer. Practitioner, Nov., 1881.

Cases 5 and 6, the date of the latter being in 1880; consequently, for only the last four cases did Listerism come under consideration. Case 6 seemed to demand every measure of this kind. The patient was suffering from peritonitis when first seen, and had had repeated attacks. The extensive and firm adhesions and necessity for drainage were anticipated. The apparatus ordered did not come to hand in time, and the case being successful without the spray, has been mainly influential in preventing its use since. The antiseptic measures put in force may be stated to have been as near an approach as possible to absolute cleanliness. But one of these cases had the service of a trained nurse. The others were cared for by some members of the family, and in the majority of cases they were individuals of less than average intelligence.

DR. MIDDLETON MICHEL, of Charleston, S. C., reports an interesting case in the *North Carolina Medical Journal*, Dec., 1880, p. 307.

DR. EDWARD L. PARTRIDGE, of New York, sends me the following :

Operation, April 28th, 1880. Mrs. M., æt. 26, married, mother of one child, three years old. Tumor multilocular; never tapped. Diet regulated, not restricted; attention to secretions. Ether. Operation completed in one hour and twenty minutes. Customary abdominal operation. Listerism without spray; tumor weighed nineteen pounds. Grew from left ovary; had one adhesion to abdominal wall. Pedicle tied with silk and dropped. No drainage. Customary after-treatment. Light diet; moderate doses quinine. Recovery. Moving about on her feet on the twentieth day. On third day, pulse 82, temp., 99.8°.

Cases of DR. C. A. KIRKLEY, Toledo, Ohio.

Five operations in all during four years; twice upon the same patient.

Number of completed ovariectomies. 3.

Single. 1.

Married, operated twice. 1.

Age of each. 33 years.

Nature of tumor. Multilocular cyst and cystic fibromata.

Anesthetic. Sulphuric ether.

Listerism not employed.

Clamp at all times.

No adhesions in case of multilocular cyst; very extensive in cystic fibromata.

Multilocular cyst of three months duration; weight 20 pounds.

Cystic fibromata six months duration; weight of first tumor, 12 ounces; second, $17\frac{1}{2}$ ounces.

Time between operations. 5 months.

Preliminary treatment as usual in such cases.

Aspirator used in all cases.

Recovery in both cases.

The cystic disease involved the left ovary.

Patient was married in January, 1877 (ovariotomy having been performed the preceding May, 1876), and a son was born in November, 1877, and a daughter within two years thereafter.

Both labors natural.

Number of exploratory operations. 2.

One was undertaken to remove a painful tumor in abdominal wall, the situation of which could not otherwise be determined, and in which case abdominal enlargement was known to be due to fibroid tumor of the uterus—intramural. Complete recovery and relief.

The other was entirely exploratory, as the ovarian disease was known to be malignant. The tumor was very large, and post-mortem removal not easy, owing to extensive and firm adhesions to the vertebral column. Separation during life would have been impossible.

Cases of DR. EDWARD W. JENKS, Chicago, Ill.

I sincerely regret my inability to comply with your request, for the reason that in the process of moving my library last year, a box containing pamphlets, records, and other papers was lost. In the box were some carefully prepared records of ovariectomies; but as I still have some hope of finding and making use of them, I prefer not to attempt to give a record of my cases from memory alone. I might state, however, that my work in the past year comprises five cases, with three recoveries and two deaths. The two fatal cases were operated on with Listerism carried out in all its details. One I am convinced died from carbolic acid poisoning, and the other from peritonitis, caused, I thought,

by the carbolic acid. In one of the successful cases, the operation was begun under spray; but owing to the failure of the two atomizers early in the operation, I feared disastrous results. But, on the contrary, the patient rapidly recovered. With the remaining, two atomizers were used in the room preceding the operation only. Every precaution was taken to have everything about the patient, operator, assistants, operating table, and instruments absolutely clean. No carbolic acid was allowed to touch the peritoneum. The abdominal wound was dressed with oiled silk, gauze, etc., after the usual method. No drainage in any instance. The pedicles were each ligated with silk, cut short, and the pedicles dropped back. Catgut I have no confidence in, and have not used it, but all intraperitoneal ligatures have been of silk, well waxed. I have deemed it of great importance that the patient should have proper preparatory treatment, and, above all, that the skin should be in a healthy condition. I use quinine freely before and following all ovariectomies. It has seemed to me that not unfrequently great damage is done by the too early administration of morphine, thus getting its depressing effect before the patient has had an opportunity to recover from the shock of the operation. Another error is, giving food when the patient cannot digest and assimilate it. Thus it often happens that following ovariectomy, patients' stomachs are filled with beef-tea, milk, brandy, etc., which is afterwards vomited, doing damage by the depressing effect. I am, therefore, in the habit of relying upon the absorption of nutriment per rectum.

Cases of DR. M. D. MANN, Buffalo, New York.

1. 5 cases.
2. 3 married. 2 single.
3. Ages. 30, 27, 35, 28, 35.
4. 1 dermoid. 4 multilocular.
5. Preliminary aspiration in all cases for diagnosis. 1st case, cyst emptied once. 5th case, 3 times.
6. 1st operation, 2 hours. 2d, 1½ hours. Others less than 1 hour.
7. Regulation of diet and bowels.
8. Ether.
9. All completed.

10. Laparotomy.
11. 1st case, full Listerism. Others, no spray.
12. Adhesions in 1st, 2d, and last cases.
13. Silk ligatures. 1 enucleation.
14. Drainage, 4 times. Glass tube.
15. After-treatment. Brandy and opium.
16. 4 recoveries. 1 death.
17. Septicemia.

The first case was a dermoid in a colored woman. Adhesions to whole of the true pelvis. Removed little more than half the cyst, and sewed the edges of the remainder to the edges of the abdominal wound. Introduced drainage-tube into the tumor, and another into the cavity behind it. Recovered, and died several months later from septicemia, due to failure to keep the remainder of the cyst clean. Very poor and ignorant.

2d case. Ovarian tumor partly developed between the walls of the broad ligament. Enucleated. No pedicle. Drainage.

3d case. Simple. Other ovary diseased and removed.

4th case. Much ascites. Drainage-tube used on that account. Other ovary removed.

5th case. Suppuration of cyst with septicemia had existed more than three months before I saw the case. Had been tapped three times, but suppuration antedated the first tapping. Emaciation extreme. Pulse 160. Temperature 102° before operation. Many recent adhesions. Some old ones. Drainage; patient survived fifty-two hours. First case was done in 1879. Others in 1882.

Cases of DR. A. F. ERICH, Baltimore.

Number of cases operated, 7.

Operation completed in 6.

Operation abandoned in consequence of most extensive and firm adhesions in the pelvis in 1.

Color, white, 6; mulatto, 1.

Nativity, American, 6; German, 1.

Married, 5; single, 2.

Ages: 22, 28, 34, 37, 51, 54, 62.

Character of tumor. Proliferating cystoma, 5. Dermoid cyst, 1. Ovarian apoplexy, 1.

Duration: One 1½ years, one 1½ years, two 2 years, one 5½ years, one 22 years, and one not known.

Puncture for purpose of diagnosis, two cases, withdrawing one ounce and one pint of fluid respectively.

Preliminary tapping and emptying cyst, one case tapped *once*, one *twice*, and one *forty-six* times. Two cases were not tapped.

Preliminary treatment, restorative and symptomatic.

Size of tumor : One (ovarian apoplexy) size of fetal head ; one each of thirty-five, forty-five and fifty-six pounds ; the others of medium size.

The anesthetic used in all cases was Squibb's sulphuric ether.

The ligature was used in five cases ; two recoveries ; clamp used in one case ; recovered.

The incision was always in the middle line and as long as necessary in order to easily separate adhesions and remove the tumor. The proper length for the incision is, in my opinion, one that will enable the operator to attain the object aimed at. No other general rule can be laid down.

Listerism was used in four cases ; not used in three. Antiseptic precautions, *i. e.*, cleanliness, carbolic acid, and permanganate solutions for washing hands, sponges, instruments and abdomen of the patient were used in all cases. Of the four cases operated under the spray, one died ; of the three operated without spray, two died.

In all the cases of proliferating cystoma (five), there were extensive adhesions ; no adhesions in the cases of dermoid cyst and ovarian apoplexy.

No drainage was used.

There were four recoveries (1, 3, 4, 5) and three deaths (2, 6, 7).

One of the deaths was due to septicemia, one to purulent peritonitis, and one to obstruction of the small intestines.

The death from septicemia followed the removal of the dermoid cyst. This tumor had very fragile walls, and on attempting to raise it up out of the abdominal cavity, it was perforated posteriorly by the sharp spiculæ of bone which were contained within it. The contents of the cyst, consisting of a dirty mass of fluid, hair, and fat, were by this accident emptied directly into the abdominal cavity. It was found impossible to thoroughly cleanse the viscera, and on the second day septicemia was developed, from which the patient died two days later.

The death from purulent peritonitis occurred in the case of ovarian apoplexy. The patient did very well for several days after the operation, but finally sank. At the post-mortem examination extensive peritonitis with fetid pus in the abdominal cavity was present. The pedicle was gangrenous.

The case of intestinal obstruction proved fatal on the tenth day after operation. The jejunum was doubled upon itself at one place and the opposing peritoneal surfaces of the gut had become adherent, causing a complete obstruction at the point of flexion. There were no evidences of septicemia. The symptoms of obstruction of the bowel were not well marked. There was absolutely no pain complained of, and only the persistent vomiting of a thin yellowish fluid and a small, somewhat rapid pulse indicated something wrong.

In the case in which the extensive and firm adhesions prevented the completion of the operation, septicemia was developed on the third day, the temperature reaching 103°. A catheter was inserted between two sutures in the line of incision and the abdominal cavity washed out with a solution of carbolic acid (1:40). The temperature rapidly fell and the patient went into violent convulsions followed by stupor. The pupils were contracted and irresponsive to light, the body bathed in a profuse cold sweat and the pulse rapid, small, and intermittent. The temperature at one time had fallen to 95°. The patient had been saved from the septicemia to almost die from carbolic acid poisoning, but under hypodermic injections of whiskey and heat to the surface, she soon rallied. In two weeks she had recovered entirely from the operation and returned home.

Two of the cases tapped died; one (dermoid cyst) of septicemia; one of intestinal obstruction. The case which had been tapped forty-six times made an excellent recovery. One case not tapped died; one recovered. Two cases of diagnostic puncture both recovered.

I am not convinced of the value of Listerism in ovariectomy. I have not observed any especially good results from it. I question the value of the drainage-tube. I have noticed in cases of abdominal section in which the drainage-tube was used, that the adhesive peritonitis around the tube soon isolates it from the abdominal cavity, and though fluid to any extent may

be injected through the tube, no secretions or fluids in the cavity of the abdomen can reach the perforations of the tube and make their exit.

Summary.—Total number of cases (except those reported under the head of “Sporadic Literature”) 1,011. Total number of recoveries, 766; total number of deaths, 745 (from septicemia, 214). The percentage of recoveries is largely in favor of those cases operated upon in private hospitals or at private residences. The cases occurring in country practice do much better than those in public hospitals, but the percentage is not as good as that of city practitioners with hospitals of their own. The statistics of country practice are too small to serve as absolute data of comparison, but the results, considering the small number reported, and the lack of the trained nursing and scientific assistance always obtainable in cities, are remarkably good. Again, the cases that come to city practitioners are frequently of an almost hopeless character, and are seen by the surgeon at a very late stage of development, while those that seek the protection of public hospitals are poor, and have suffered from want of proper food and attention. *Drainage* was used in a very small percentage of these cases; Goodell using it fourteen times, Murphy eight, Mundé twice, Reeve once, Mann four times. Sims prefers complete drainage to Listerism if one only could be used.

Treatment of Pedicle.—Thomas used the clamp in one hundred and three cases and the ligature in ninety-six. Homans writes: “I always compress the pedicle with Dawson’s clamp, then burn off the pedicle with Paquelin’s cautery; tie with a double ligature (in the sulcus made by the clamp); remove the clamp and drop the stump.” Byford ligates the pedicle with strong silk, cuts the silk short and drops back. Wilson used the clamp in his first five cases, and the ligature in his last four; Murphy uses ligature in every case; Wile uses the ligature. McGuire used the clamp in ten cases, ligature in eight; Mundé used clamp in one case; ligature, Paquelin, pedicle dropped in one case; Kimball ligated the pedicle, dropped back the stump and brought ligature outside in eighty-five cases; in twenty-four cases the ligature was cut short, and in one hundred and fifty-eight cases the clamp was used. Goodell

used the clamp in three cases, ligature in fifty-eight; Dawson used the clamp in three cases, silk ligature in one; Janvrin used clamp in one case; Reeve and Partridge used the ligature. In some cases the ligature was brought outside and made to act as drainage. Kirkley uses the clamp; Jenks ties with silk and drops back; Mann uses silk ligature; Erich used the clamp once and the ligature five times.

As the clamp and Listerism seem to be incompatible in the larger number of cases reported, the pedicle was treated with the silk ligature, though Homans prefers to use both, and even supplements them with Paquelin's cautery. In many cases the clamp has stood the surgeon in good stead and has accomplished for him results which could not have been obtained without it. The treatment of the pedicle by the actual cautery has been followed by remarkable results. Keith, combining this procedure with the antiseptic method, did not lose a single case out of seventy operated upon. If the pedicle be very short, the practice of American ovariectomists is to ligate and return, the clamp being used where the pedicle is long and where the external method promises well. Where the pedicle is short and thick, it is transfixed by double ligatures and dropped back. The instances where the pedicle has been held between the lips of the wound by pins and sutures are not frequent.

Listerism.—In this country the practice of antiseptic ovariectomy, as distinguished from the treatment by perfect cleanliness alone, is largely in the ascendant. Listerism it all is, but modified in the non-essentials by individual conceits. The projection of the carbolic spray directly upon the abdominal wound has lost ground, but is still made use of by Goodell and a few other eminent ovariectomists. As opposed to routine Listerism in any form, Dr. George J. Engelmann, of St. Louis, writing to the *American Journal of Medical Sciences* (April, 1882), says: "Avoid routine Listerism, and especially the carbolic spray over the hands of the operator and into the abdominal cavity. Cleanliness, not carbolic acid, is necessary. Keep sponges clean and warm, but not carbolized; avoid carbolic acid about the peritoneum and open surfaces. Ligatures, sutures, and instruments should be clean, but not carbolized." Dr. Jenks has seen cases of undoubted carbolic acid poisoning from the spray, and Dr. Latta refuses to use Listerism in any form,

preferring water that has been boiled. Dr. Byrne regards Listerism as a surgical craze. In Dr. Erich's cases, of the four operated upon under the spray, one died; of the three operated upon without the spray, two died. At the same time he records an interesting case of poisoning. The experience of Dr. Sims is largely in favor of strict antiseptics.

DR. THOMAS writes: "The practice which a long and careful observation of Listerism has led me to adopt, is the following: 1st. Believing fully that carbolic acid and some kindred substances are true germicides, I employ them in that capacity in every operation. 2d. In every operation the instruments and hands of operator and assistants are first thoroughly cleansed in carbolized water, and the instruments are kept carefully immersed in a germicide fluid. 3d. The germicide spray is never projected upon the parts operated upon, but the room in which the operation is performed is kept in a foggy condition by its general dissemination. 4th. Every uterine examination, whether made during labor or in the non-impregnated state, is made under antiseptic precautions."

DR. R. F. WEIR writes: "I am still an advocate of full Listerism in abdominal surgery. Its effect upon the patient is not a serious objection. The spray should be a very fine one, and discretion should be used in keeping it too long in contact with the peritoneum. I have not seen, when properly used, any poisoning from carbolic acid in operations involving the peritoneum, and only a slight elevation of temperature and passing tenderness along or adjacent to the wound afterwards. As to the effects upon the surgeon, other than the annoyance of roughened hands, or from the obscuring of eyeglasses when required, I have not perceived any in myself or in my colleagues or assistants. I have always used in private practice Bowdler and Bickerdike's acid, which Lister considers the best and the least irritating. The error made, even by competent surgeons, is in using the carbolic acid too much or too freely. It is, so far with me, the most reliable arrester of putrefaction for surgical uses. It has its objections, for, in compound fractures and in large cavity-like wounds, poisoning has occurred with me, and of a serious nature, too, but it yet holds the palm contrasted with iodoform and the other antiseptics. I have only tried eucalyptus in a few

instances, but it answers well, and it promises much as a substitute for carbolic acid, so also does corrosive sublimate. I have had some forty major amputations, of the thigh, leg, arm, and forearm, without a single death; also have had a consecutive list of seventy similar compound fractures without a death, but then lost three severe railroad crushes in a natural but wrong endeavor to save them. It was crowding Listerism too far. Now, in one hundred and fifty (150) major compound fractures, my deaths have been three only. My individual experience in ovariectomy is small, but I have witnessed and assisted "Listerally" in quite a number. My opinions are based on these, and also on the surgery of the abdomen that arises in a general hospital service, in laparotomy, herniotomy, etc. I may add that a change is frequently made with advantage in the Lister dressing, by using carbolized jute instead of the gauze. It packs better and allows of firmer compression."

DR. J. E. JANVRIN sends the following: . . . "As regards Listerism, I have *never* seen any bad effects from it, either upon patient or operator, and have used it for at least two hours at a time frequently. I believe that a spray in the room, directed somewhere near the patient, but high up, and not *at* or *into* the abdominal cavity, is all that is necessary in the way of *spray*, and is never harmful, all other details of Listerism, of course, being carried out fully.

I believe that patients have a better chance of recovery under Listerism than without it, other things being equal. Still, I do not think it at all necessary to have the spray directed upon the patient. Only enough of it in the room to carbolize the air."

DR. J. BYRNE says: . . . "With regard to thorough 'Listerism,' I have never believed in it or practised it in a single instance. My opinions as to the evil effects of carbolic-acid spray on peritoneal surfaces, though in one sense entirely theoretical, are quite in accord with those of Thomas, Keith, Bantock, and others of their way of thinking. Nevertheless, while I look upon 'Listerism' as a surgical craze, I cannot but feel that surgery, and consequently humanity, may both gain much by it in the long run. In fact, it is accomplishing for surgery what infinitesimal medication has done for legitimate and rational therapeutics."

DR. PAUL F. MUNDÉ writes: "Although my experience in abdominal surgery has been too small to entitle me to speak authoritatively, still I have decided views, based on quite a large number of gynecological operations, as to the value of antiseptics. I have always acted on the principle that the cleaner all the instruments, sponges, hands of operator and assistants, patient, and all her surroundings and belongings (room, bed, table, linen) are kept, both during and after the operation, the more likely we are to have a good result, a speedy union of the wound, and the absence of suppuration and febrile reaction. As this extreme cleanliness is best procured and maintained by washing and immersing all the objects mentioned in a dilute solution of carbolic acid or enveloping them in a vapor containing that agent, I have invariably employed it in *all* my operations on the female genital organs in the manner indicated. I have never used the spray, believing the wound to be sufficiently disinfected by the precautions mentioned. I am confident that this scrupulous attention to cleanliness by thorough disinfection of *everything* and *everybody* connected, however remotely, with the operation, has enabled me to obtain perfect union with entire absence of febrile reaction in a large number of plastic operations on the cervix, perineum, and vagina at times when (as was particularly the case during the past spring) wounds were healing badly, septic infection was exceedingly frequent both in hospital and private practice, and several hospitals had been entirely closed to any operation."

DR. W. H. BAKER writes: . . . "As to Listerism, I have never seen any bad effects, either upon patient or operator, and in all my cases, where it was used, and fatal results followed, I have felt that I could trace the result to some defect in its use."

DR. D. HAYES AGNEW writes: . . . "I may say that the last five cases (abdominal ovariectomy) were done under the carbolic-acid spray, and four recovered. With reference to the effects upon the patient and the operator, I observed nothing unusual."

DR. HORATIO R. STORER advises as follows: "Regarding Listerism, I used the carbolic spray, as well as bath for hands and instruments, for many years, both during operation and in my wards. You will find reference to this in my 'Nurses

and Nursing.' As to effect on patient, outside from its alleged specific property, like every other surgeon, I have seen it occasion both local and general disturbance. As to effect on operator, I have often myself experienced local and general inconvenience, and have known it in my friends. Its chief disadvantage, however, in this respect, is a moral one, in that the average operator is now inclined to rely upon it inordinately, and therefore prone to neglect other precautions of equal value. As to its germicidal power, I used to think it essential. Conversation with Keith in 1876, and evidence such as that by Lawson Tait within a few months (*Medical Times and Gazette*), have so far modified my opinion, that I now say that, properly used, it should do no harm."

DR. P. J. MURPHY writes: "In reply to your inquiries regarding the effect of carbolic acid, I beg to state that after ten years' experience in hospital practice, I am convinced of its power as a true germicide, antiseptic, and sedative. I have performed all my ovariectomies either according to true Listerism, or in a modified manner. In the two deaths following ovariectomy, post-mortem examination revealed not the slightest trace of purulent matter in the abdominal cavity or surrounding the uterus proper. I have used it in all cases of delivery as a vaginal douche following parturition, and always insist upon my assistants washing their hands in a solution of carbolized water prior to examination preceding delivery. It has always proved efficacious when used in septic conditions which have occurred in the lying-in department of this hospital, and when its timely aid has been invoked, I am quite sure that to it alone can be traced the life of the patient. I have been accustomed to use it in inflamed endometrium and in erosions of the cervix uteri as a topical application. I have perceived that it modifies, and in some instances entirely checks, the purulent secretions in chronic inflammations of the mucous membrane of the uterus. I have never perceived any ill effects upon the operator, but I can well conceive how a surgeon suffering from a catarrhal condition of the throat might be somewhat affected by a vapor of carbolized air. I have given it internally in bronchorrhea."

DR. S. W. GROSS says: "In the cases in which I have employed so-called Listerism, I have not seen any bad effects

produced either upon the patient or myself. A 1 to 30 solution of carbolic acid was used for the spray, which ample observation has proved to be too weak to act as a germicide. Used stronger, it might produce symptoms of poisoning. My own opinion is, that antiseptics may be dispensed with."

From an analysis of all the cases reported, the percentage of recoveries is overwhelmingly in favor of Listerism, and, as many of these were performed under a direct projection of the carbolized spray, American statistics, considered as isolated factors, do not sustain its severe condemnation. Its sudden appearance in abdominal surgery and its enthusiastic reception, together with its equally sudden abandonment, were due largely to the state of professional feeling in England, and more especially to the large experience of one man. It is also not unworthy of remark that these cases of poisoning by the spray should have occurred at so late a day, and that the instances should have become prominent at the same time. May it not be a fact that the recent discussion of Listerism has exhumed long buried cases from the memory of the operator, where the fatal result was in all honesty attributed to some other cause, which at the time he believed to be firmly established, but which his antagonism to the spray has since led him to relegate to the dire effects of carbolic acid? These hypotheses are merely thrown out, that intelligent consideration may be given to a subject which is intimately interwoven with successful abdominal surgery. It would be a grave error to abandon a practice which has achieved brilliant results, until something shall be brought forth which shall be as thoroughly protective, and in the use of which there may be no possible dangers. Time alone can demonstrate satisfactorily the relative values of Listerism and of perfect cleanliness without Listerism. The results of a large number of cases in which cleanliness and attention to detail have alone been used, are the only criteria upon which we can strike a judicial balance.

Until then a consideration of all these facts and opinions, based upon large and intelligent experiences, points to the conclusion that Listerism is not dead, as a German surgeon exclaimed at the Medical Congress, but that, in some form or other, it governs the practices of most of our leading surgeons. It has accomplished more in the short era of its life than any

other single discovery in surgery during the last fifty years. It has had a past and a present, and it will have a permanent and satisfying future. That cases of poisoning have happened from the carbolic spray, both in patient and operator, is not to be disputed. Especially in case of the surgeon in charge, such a condition may have been engendered by a peculiar idiosyncrasy in himself. Some function may have become weakened by chronic disease, and to this the carbolic acid addressed itself with especial virulence. Keith's remarks, in view of his previous marvellous success, in which, it is worthy of notice, he does not report a case of poisoning, are far from convincing. The utility of Listerism is not weakened because in his later operations Keith lost some cases from carbolic poisoning. The rather should we infer that proper precautions and due discrimination had not governed the amount, quality, and duration of the spray. When any single operator shall show a success in seventy odd consecutive ovariectomies without Listerism, equal to that which Keith reports in a similar number of operations with Listerism, there will be some constants upon which to base mathematical conclusions. It seems to me that the absorbent power of exposed surfaces will be exercised just as perniciously whether a room be surcharged with carbolic vapor, or whether the spray be projected directly upon the wound. Certainly the effect upon the operator, who inhales it, will be as marked in one instance as in the other. The condition of carbolic poisoning, where the symptoms are not pronounced, is usually dissipated by fresh air, and we have yet to find any structural lesions caused by the absorption of carbolic acid. The excess is usually excreted by the lungs and by the skin. The absorbents can only take up a certain amount at a time, and this they would do just as certainly from the impregnated atmosphere of a close operating room as they could from the direct spray, part of the force of which is spent upon surrounding structures. The argument cannot stand which would discountenance Listerism because, out of a large number of cases, one or two had died of septicemia. Because of this, shall we say that carbolic acid is not a germicide; or shall we be inclined to believe that there were undiagnosed conditions, or peculiarities of temperament, or a want of judi-

cious management of the spray, in these fatal cases, which might account for the termination? As opposed to the exceptional cases in which Listerism did not prevent blood-poisoning, how many may be cited in which it has checked putrefaction? There have been deaths from the administration of both ether and chloroform; but because of this, we do not rush into a fanatic attempt to do away with their employment. If it be granted that carbolic acid is a powerful germicide, we cannot deny its efficacy in surgical cases. Is the risk in its employment any greater than that which obtains from drainage—which presupposes the existence of a foreign body in the wound, and where the danger of septic absorption is infinitely more imminent, and the risk of ventral hernia is always present? That perfect cleanliness and modified antiseptic precautions are essential in abdominal surgery, none will deny. The European letter of Dr. R. Stausbury Sutton, in the *Philadelphia Medical and Surgical Reporter*, April 29th, 1882, contains the following remarks:

“In about six hundred surgical operations, independent of laparotomies, at which I have been present, the method of antiseptics has varied with the operator. But I have not seen an operation done in Europe without *complete* antiseptic precautions; Listerism it all is, but varied to some degree with each operator.”

The experiences of Drs. Sims and Homans with Listerism are significant, and cannot be questioned. Dr. Sims states that since he began the use of Listerism, he had not lost a case in twelve cases. Previous to this, he had thirty-three operations and nine deaths. Dr. Homans is equally commendatory. Dr. Goodell refuses yet to give up the spray. Dr. Thomas operates in a room surcharged with carbolic vapor, disinfecting sutures, instruments, etc. The same practice obtains at the Columbia Hospital for Women under Dr. P. J. Murphy. The percentage of recoveries under Listerism in American ovariectomies is much larger than when antiseptic precautions were not made use of. If, upon the statement of Keith, antiseptic precautions were to be suddenly abolished, the death-rate would be largely increased, for the reason that certain necessary precautions, and attention to perfect cleanliness,

would be lost sight of. No sound conclusion can be arrived at until statistics of a large number of cases, done without Listerism, can be furnished, and until such a time, it is certainly safer to continue in a course which has given such good results.

[ERRATA.—In the report of Dr. Murphy's cases in the April number, page 356, read: "Adhesions in all cases, especially in those tapped prior to the operation. In six cases the adhesions were very slight."]

THE ETIOLOGY OF UTERINE DISPLACEMENTS AND DISTORTIONS (FLEXIONS).

BY

GRAILY HEWITT, M.D.,

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For some few years past, I have taken particular pains to ascertain the cause of the displacement or distortion in cases of this kind coming under my notice. In a considerable number of cases, I found it possible to trace in the previous history particular causes explanatory of the occurrence. Due care has been taken to guard as carefully as possible against sources of fallacy in tracing the relation of the cause and effect.

It is remarkable how frequently the particular cause of the displacement or distortion has proved to be some external mechanical physical injury. The following data illustrate this part of the subject.

I have selected from records of cases collected during six years of private practice 340 cases in which the patient was single, or, if married, was sterile, and in which the uterus was affected with ante- or retroflexion. I have purposely excluded for the moment cases of patients who had had children, as in such cases child-birth, or the sequelæ of child-bed, introduce disturbing considerations.

340 Cases of Single or Sterile Patients Affected with Uterine Flexions.

The flexion distinctly traced to	Retro- flexions.	Ante- flexions.	Total.
Strains, lifting, carrying, nursing, standing, dancing, gymnastics, croquet, swimming, etc.	13	49	62
Falls or other accidents.....	11	18	29
Horse exercise.....	6	9	15
Over-walking.....	8	7	15
Organ or harmonium playing.....	1	3	4
Long railway journey.....	1	1	2
Retention of urine in railway journey.....	1	1	2
Fright.....	0	1	1
Sea-sickness (three months' voyage).....	0	1	1
Measles.....	1	0	1
Scarlet fever or typhoid fever.....	2	11	13
Menstruation checked by cold.....	0	3	3
Menstruation checked by sea-bathing.....	0	1	1
	44 ¹	105 ²	149

It thus appears that $\frac{149}{349}$ or 43 per cent of cases of flexion in single women, or, if married, sterile, the cause was distinctly traced to some one of the above-mentioned agencies.

It is right to state that, in three of the above cases, the patient had had a miscarriage, accident, or strain, having produced apparently the miscarriage as well as the displacement, or, to speak more correctly, the accident or strain was responsible both for the displacement and the miscarriage.

Strains resulting from efforts in lifting, nursing, etc., constituted a very common cause—62 out of 149 cases. They most commonly produce the effect in patients who undertake such exertions without proper training or strength. Nursing and lifting sick relatives appear to be very dangerous. Lifting, or occupations involving much standing, are responsible in many cases. ‘Stretching up to a cord,’ ‘drawing the cork of a bottle,’ ‘carrying a child,’ ‘strain at archery,’ ‘moving furniture,’ ‘rowing,’ ‘use of sewing-machine,’ ‘lifting a patient from the ground,’ ‘lifting washstand,’ were the causes traced in other instances. Unnecessary gymnastic feats, excessive standing at croquet, one or two cases traceable to excessive swimming may also be mentioned.

‘Falls’ or other accidents include many cases in the tabular list above given. ‘A complete somersault down a flight of steps,’ ‘thrown from a carriage,’ ‘fall from a carriage,’ ‘thrown from a horse,’ ‘fall from a horse,’ falls on the back, on the

¹ Selected from 83 cases }
² Selected from 257 cases } = 340.

ground, down-stairs, etc.—under the foregoing heads I find cases of retroflexion recorded. ‘Jump from a carriage,’ ‘slipped down flight of stairs,’ ‘fall from back of dog-cart,’ ‘fall from horse,’ ‘slipped down-stairs,’ ‘fall down steps,’ ‘jump from a horse,’ ‘fall from a horse and horse rolled over her’—under these heads cases of antelexion could be quoted.

Horse exercise was clearly traced as a cause in several cases. In one case, it indirectly led to displacement, owing to prolonged retention of urine. In weakly young women, imperfectly trained to it, horse exercise appears decidedly injurious.

Over-walking includes several cases. ‘Long mountain walks,’ ‘daily long walks,’ and ‘long walks to catch a train,’ are causes traced in some retroflexion cases. ‘Long walks up-hill,’ ‘very fatiguing walk,’ ‘walk during menstrual period,’ etc., in certain cases of antelexion. Organ or harmonium playing was found injurious in a few cases. Retention of urine during long railway journey, fright, etc.—these cases require no particular mention.

There were fourteen cases in which the cause assigned is measles, scarlet fever, or typhoid fever. The reason for introducing these cases is, that the cases on investigation proved that the uterine affection had occurred from ordinary walking during convalescence from the fever. The conclusion formed was, that the uterus, enfeebled in common with the other organs of the body, gave way under ordinary exertion, and the preceding fever was thus really responsible for the resulting uterine affection.

The causes of uterine distortions and displacements may be divided into three classes—predisposing, exciting, and general.

1. *Predisposing causes*:—

Undue softness of the uterus—

From mal-nutrition (chronic starvation).

From subinvolution following pregnancy.

Physical general prostration and weakness, as from fever etc.

Rupture of perineum.

Previous pregnancy.

2. *Exciting causes*:—

Accidents, *e. g.*, strains, falls, railway and carriage accidents.

Over-exercise—Long walks or drives, excessive exercise

during menstruation, excessive exercise during pregnancy, exercise too soon after confinement.

Special exercises—Horse exercise, gymnastics (inappropriate or injudiciously selected), croquet, lawn-tennis, etc. (in excess).

Special occupations—Requiring much standing, as counter-work, requiring carrying and lifting, as nursing, washing, use of sewing machine.

Straining in defecation, etc.

Marriage.

3. *General causes* :—

Of the predisposing causes, *undue softness of the uterus* is, in my opinion, by far the most important. It may be due to malnutrition, either in a single woman or in one who has borne children. *General prostration and weakness*, as from the effects of fever, appears to be a powerful predisposing cause (see list of cases enumerated at p. 655). Clinical facts show that uterine flexions are liable to be initiated by exercise or movement taken shortly after prostration from fevers. *Rupture of the perineum* is a special predisposing cause: the support of the lower part of the vaginal canal is taken away, and this is a powerful predisposition to displacement of the uterus and to flexion of the organ.

Previous pregnancy predisposes to flexion in several ways. The influence of rupture of the perineum (if it exist) has already been alluded to. But in other ways a predisposition may exist. Thus, if the uterus is left in a state of subinvolution, the mere weight of the organ tends to produce flexion. If the organ remains softer than usual, as well as in a state of subinvolution, the predisposition will be greater. Again, the loosening of the attachments of the uterus is frequently great during pregnancy and labor, and even if no lesion is discoverable, the perfect fixation of the uterus may have been lost and predisposition to flexion created.

Repeated pregnancy in women badly nourished has a tendency to weaken the uterus very much. The uterus has little rest—it has scarcely time to recover from the effect of one pregnancy before another occurs. In the end, the uterus becomes flexed, the flexion is confirmed, and either abortions or sterility (secondary) result.

With reference to the *exciting* causes of flexions, it will be necessary to discuss these several exciting causes in detail.

Accidents, including *strains, falls, and railway or carriage accidents*, are very important. It has hardly as yet come to be recognized as a fact that the uterus may be very seriously displaced and injured by severe accidents. The number of cases of severe injury to the uterus from these causes recorded in my case-books is considerable. The nature of the injury is generally, as experience has informed me, not understood at the time of the accident: the patient feels ill, generally no bones are broken, there is a severe shock, the effects of which last a few hours or a few days, or longer, and gradually the patient loses the pain, and no further notice is taken of it. But later on, it is discovered that the patient is more or less completely incapacitated, and careful examination reveals the fact that the uterus is displaced and distorted, and investigation of the facts conclusively shows that the discomfort or incapacity date from a certain accident. One of the first cases of the kind which came under my notice, was that of a young lady who, travelling by train, had been rolled down a railway embankment, and had become affected with acute retroflexion of the uterus as the result. The record of many cases of an analogous kind which is in my possession, gives unmistakable proof of the effect of accidents in producing such displacements and distortions.

The effect of a severe concussion on the uterus varies in different cases, and it varies according as it is accompanied or not by a severe strain. It is not uncommon for the concussion and the strain to come together. There is the fall, and the muscular effort to avoid the fall or accident. In the latter case, the displacement of the uterus is likely to be greater. The facts in my possession show that the uterus may be forcibly driven downwards to the floor of the pelvis, or to the back part of the pelvis, into one corner of it as it were, or that it may be actually driven out of the vagina [at least, I have known of one case of the latter kind in a patient who had had a child, and who, while in the standing position, slipped from the table on which she was standing to the floor]. More generally, the uterus is not only driven downwards to the floor of the pelvis, but it is bent backwards or forwards, very acutely, at the same time. It was believed by Dr. Squarey that rupture of the uterine fibres sometimes occurs in the suddenly occurring acute flexion cases, and I consider it quite possible that it is so. At all events, it is not uncommon for some blood to escape from the vagina

after such accidents. The effect of the blow or concussion will vary probably according to the position of the patient at the time, and the condition of the uterus, but when the case is investigated, it is found that the uterus remains on the floor of the pelvis, or in one corner, that it is anteflexed or retroflexed. In some exceptional cases, the organ is quite low down, the body of the uterus being turned neither forwards nor backwards as the result of the accident or blow received. It is important to note that, when bones are broken or other notable injuries received, the internal injury to the uterus may be hidden or escape notice. Two cases of this kind occur to me to mention. One was that of a lady who fell and injured the sacrum, but who became afterwards paraplegic. The paraplegia was naturally set down to the spinal injury, but it proved to be due to a retroflexion of the uterus, and the patient was completely cured by restoration of the shape of the uterus. Another was that of a young lady who fell and broke her arm, and it was only some months after that obstinate sickness attracted attention, and it was found that the uterus had been violently displaced and pushed into one of the posterior corners of the pelvis.

Violent straining may produce severe flexion. Of this class of cases may be mentioned, one in which the patient, quite unaccustomed to such an exertion, lifted a helpless invalid from the floor, who had suddenly rolled out of his chair, the result being severe flexion. Another, that of a young lady who, in a spirit of bravado, carried a very heavy cheese across the room, and became forthwith an invalid from severe flexion of the uterus.

Long walks may produce at once acute flexion, or, continued from day to day, may slowly give rise to flexion. Very long walks are certainly dangerous to those unaccustomed to them. Young recently married ladies, untrained and unfit for such continuous exertion, often inflict very serious injury upon themselves by walking about all day during the honeymoon. Long mountain walks should not be undertaken by ladies unless trained for the purpose and in robust health; and if a predisposition to flexion exists, much harm may be done by them. 'A long walk of ten miles to catch a train' produced severe retroflexion. Long walks often inflict serious injury on young women at school who do not happen to be 'strong,' and who are therefore predisposed to suffer from flexion.

It appears that long walks are more dangerous if undertaken during the menstrual period, no doubt because the uterus is at that time heavier, larger, and more vascular, and therefore more liable to become displaced. Long walks are not uncommonly the cause of abortion during the second or third month, the uterus becoming displaced or flexed, the abortion is thus produced. Another important class of cases are those in which walking in excess is undertaken too soon after labor, while the uterus is still heavy, and in a state of sub-involution.

Horse exercise may cause flexion of the uterus. It may be produced suddenly and at once, or more gradually. It is not so liable to happen if the individual be strong and properly trained to it; but evidence that could be adduced seems to show that it is a kind of exercise not free from danger of producing serious uterine mischief, even when judiciously managed. The evidence shows that the uterus is liable to be pushed downwards on the floor of the pelvis, and generally very decidedly flexed backwards or forwards. If there be no particular predisposition to flexion, horse exercise may do no harm, but it is never certain that it will not.

Gymnastics.—Some few cases of severe flexion were undoubtedly traced to too severe gymnastic exercises. In two cases, severe flexions were produced by jumping down from a considerable height; in one, severe and most troublesome retroflexion was produced by the feat of raising the body from the horizontal position without the use of the arms. In two cases, rowing was distinctly traced as the cause.

Dr. Aveling, who has published a valuable work "On the Influence of Posture on the Health of Women," considers that the erect posture has much influence in *producing* disease, gravitation giving rise to vascularity. He considers the sitting posture on a chair as unnatural and injurious, and would prefer the sitting posture on the floor. It is in accordance also with my experience that the prolonged ordinary sitting posture is injurious, and I have seen many cases where this posture could not be borne at all. But I do not know whether sitting on the floor would or would not prove equally inconvenient.

Lawn-tennis, badminton, and croquet, when carried to excess, and in individuals predisposed to flexion, are not free from danger, though doubtless innocent enough under other circumstances.

The next class of cases are special occupations requiring much standing. Young women standing for many hours consecutively at the counter become frequently affected with flexion of the uterus, more rapidly in proportion as they are predisposed to its occurrence. In hospital practice, such cases not uncommonly present themselves. Dr. Edis has lately done good service in calling public attention to the injurious effects resulting from such over-standing; the production of severe flexion of the uterus is certainly one of them.

The occupation of nursing, involving, as it does, necessity, occasionally, at least, for lifting invalids or for standing many hours together, is liable to cause severe flexions in the case of young women who are not strong and properly trained to the work. Numerous instances have fallen under my notice in which permanent ill-health or incapacity, due to such mischief produced while nursing a sick relative, has been observed.

Laundry work is perhaps one of the most trying to the attachments and connections of the uterus. It is liable to produce severe flexion, though it is more commonly the case that actual prolapsus is produced by excessive labor of this kind. The use of the sewing-machine, playing the harmonium or organ, are other occupations requiring mention. Some severe uterine flexions have been produced by these occupations in cases which have come under my notice.

Straining in defecation is both a consequence and a cause of uterine flexion. Nothing is more common than to meet with cases in which uterine displacement and flexion give rise to constipation. The effort required to relieve the bowel increases the existing flexion. This is more particularly the case in retroflexion. I have seen a case of retroflexion in which the fundus uteri was driven downwards by the straining effort into the embraces of the sphincter ani, most effectively blocking up the canal like a ball-valve.

Marriage must be mentioned among the causes of flexion. In cases where there is a predisposition to flexion, and where the uterus is soft and weak, intercourse has often a very prejudicial effect; and marriage in such cases may lead to troublesome disease of the uterus in consequence of mechanical disturbing influence thereby brought to bear upon the uterus.

Under the head of *general causes of flexion* must be included such as are not included in the foregoing classes. It seems

probable that, were the true history of every individual case known, the cause would be evident enough. I have found it possible to assign a cause to a very large percentage of the cases which have come under my notice, and have observed frequently that the cause has been discovered some time after the patient has been under treatment. Slight accidents, even severe ones, are often passed unnoticed, and therefore forgotten. In many cases, no doubt, the flexion occurs gradually only; the cause in operation and tending to produce it is not severe in its action, but produces after a time a perceptible effect by mere persistence of slow attack. There is generally in such cases a slight predisposition to begin with; and although the exertion or exercise taken by the patient is nothing out of the ordinary, it is more than can be endured; and in the end, after many years, perhaps, the uterus is found affected with a severe form of flexion. Young women, imperfectly fed, having no stamina to begin with, and called upon to undertake duties involving standing or walking or other exertion—governesses, for instance, called upon daily to take long walks with their more robust pupils—offer numerous instances of the truth of these remarks.

DIAGNOSIS OF OVARIAN CYSTS BY MEANS OF THE
EXAMINATION OF THE CONTENTS.

BY

HENRY J. GARRIGUES, A.M., M.D.,

New York.

(With Sixty-one Woodcuts.)

[Concluded from page 427.]

21. *Cysts of the Pancreas.*

PANCREATIC cysts of surgical dimensions are exceedingly rare. A few have been found in autopsies, but I have been unable to find that any has been operated before, nor that even the possibility of mistaking one for an ovarian cyst has been mentioned. The first part of this treatise was already printed, and the second in type when my material received a valuable addition (operative case lix.) by Dr. Nathan Bozeman's extir-

pation of a large cyst of this kind. For the clinical and operative, as well as anatomical, details of this rare case I refer the reader to the report in New York *Medical Record*, 1882, p. 46, and my paper, *ibidem*, p. 286. Here we have only to deal with the fluid and the surface which secreted it.

The cyst and fluid together weighed twenty and a half pounds, and the fluid measured two and one-half gallons.

The fluid looked entirely like that of the most common myxoid ovarian cysts. It was yellowish-gray, viscid, had a specific gravity of 1020, acid reaction, no smell. It did not coagulate spontaneously, but considerably by boiling. The acid reaction is very strange, and I would state that it was not ascertained until twenty-eight hours after the operation, but the fluid had been kept in a vial with a well-fitting glass stopper, was quite fresh, had no odor, and did not contain any



FIG. 55. —Thready cell-débris in Pancreas Cyst.

bacteria. Some ovarian fluid which had been standing several days in a similar vial, was alkaline.

The microscope revealed, 1st, pigmented Bennett's corpuscles; 2d, innumerable small granular bodies with dark granules, like some of the nuclei found in ovarian fluid (Fig. 20). 3d, epithelial flakes in a semi-dissolved condition, including the above-mentioned pigmented bodies; 4th, innumerable irregular bodies composed of a few short threads. The examination of the fluid in a secondary cyst proved them to be débris of the bodies of the epithelial cells. No nuclei with shining granules nor epithelial cells were found in the fluid.

This fluid differed from ovarian fluid by the presence of the thready bodies, by the very small and uniform size of the nuclei, and by the acid reaction.

The cyst was, surgically speaking, a monocyst, but in several places were seen secondary cysts as large as a small hen's egg.

On opening one of these, a clear fluid like raw albumen flowed out, which only contained nuclei, melting epithelium, pigmented Bennett's corpuscles, and red blood-corpuscles. But

from the same compartment came a deposit composed of a brownish-gray thick fluid, which was full of pigmented Bennett's corpuscles and columnar epithelial cells. This fluid could not be distinguished from that of an ovarian cyst, and the microscopical examination of the hardened wall showed also a similar structure as that of ovarian cysts.

The inner surface formed cup-like depressions separated by tongues, all covered with goblet-shaped epithelium (Fig 56). In some places were found closed pouches filled with epithelial cells. Several such pouches were found one beneath the other,

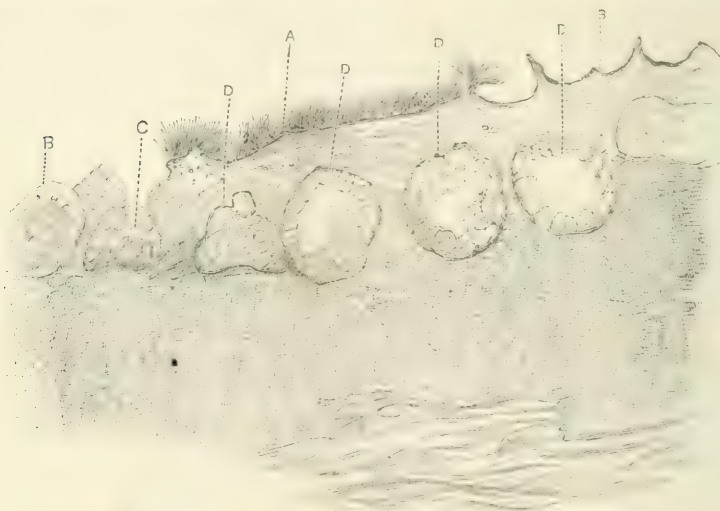


FIG. 56.

Pancreas Cyst: A, Surface epithelium; B, cup-shaped depressions separated by tongues. The epithelium lost during preparation. C, Epithelial pouch still in connection with surface; D, Epithelial pouches all surrounded by connective tissue with numerous cells ($\times 120$).

exactly as in proliferating ovarian cysts. The smaller of these pouches had no lumen, but in the larger there appeared a cavity.

The epithelium seen in front view was composed of cells with four, five, or six sides. Seen in side view the cells showed a small nucleus at the lower end. They were long and thin, but broader at their upper end, which appeared to be open (Fig. 57). In many places it was seen how the epithelium began to form pouches. The whole formation of secondary cysts is exactly the same as in ovarian cysts. The epithelium forms pouches which at first are open. The connective tissue rises,

by an abundant cell proliferation, like a wall all around such a pouch, until it surrounds it altogether. Then we have a closed pouch filled with epithelium and surrounded by connective tissue, and after that the same process is repeated, forming several rows of closed pouches, which in the course of time be-

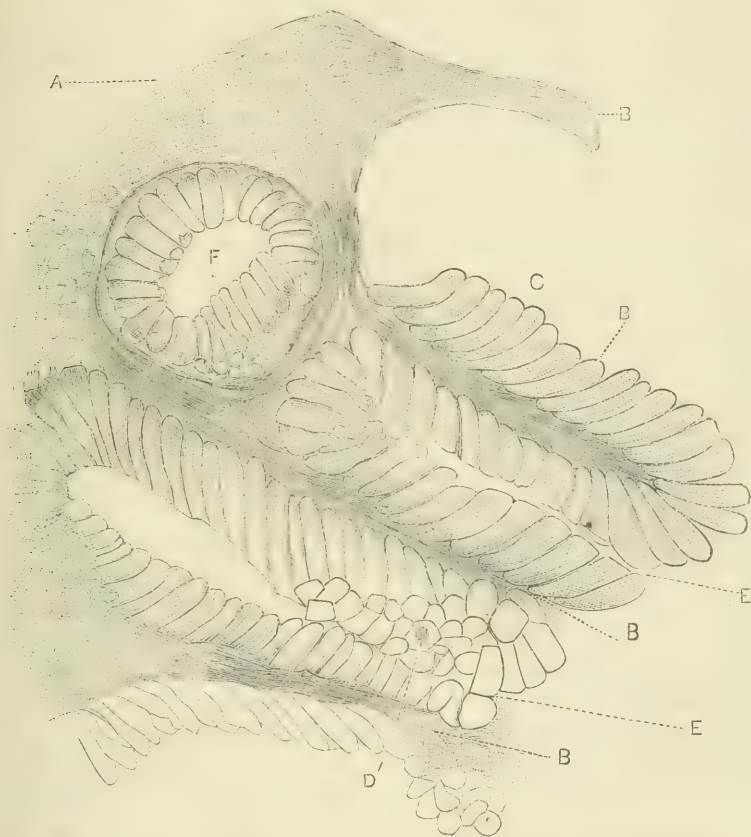


FIG. 57.

Pancreas Cyst. A, Connective tissue; BB, tongue-shaped prolongations of the same; C, Epithelium in side-view; D, Epithelium in front-view; EE, open epithelial pouches; F, closed epithelial pouch surrounded by connective tissue, $\times 400$.

come secondary cysts. Later a process of absorption takes place in the partitions and several secondary cysts melt together to one or open into the main cyst.

In several places the epithelium was found raised from the underlying tissue by extravasated blood.

In the discussion following my exhibition of specimens taken

from this cyst, in the Pathological Society,¹ Dr. Geo. L. Peabody mentioned a case which he had found at an autopsy, and where the cyst consisted of connective tissue, and was lined with cylindrical epithelium, exactly as in my specimens.

22. *Cysts of the Omentum.*

Cysts of the omentum are perhaps still rarer than those of the pancreas. Peaslee mentions a case of a subperitoneal serous cyst combined with an omentum "studded with or rather made up of clusters of hydatid-looking growths, which varied in size from that of a swan-shot to that of a grape. Some of these were cystic and contained a clear fluid; they could be most readily detached from their points of attachment. The fluid would not coagulate when heat was applied." This would make us think of echinococci, but on scraping the interior of the cysts, and placing the débris under a microscope, an abundance of large circular nucleated cells could be seen, as well as numerous spindle-shaped ones.

Dr. Thomas² mentions a case reported by Safford Lee, which was tapped forty-eight times, and was found by autopsy to be omental.

I have myself tapped a case (xxvi.) belonging to this class. From the clinical facts and the relations found immediately after tapping I took it to be a collection in the omentum accompanying cancer. The patient was a woman, fifty-five years old. In the right side of the abdomen was found a freely movable tumor as large as the two fists, the lower part was fluctuating, the upper very hard and tender on pressure. From this part a broad petiolus went up to the lower surface of the liver; four fluid ounces and two drachms of fluid were withdrawn when the cyst collapsed. The canula was felt to go right up to the hard part of the tumor. The liver border was felt about an inch lower than normal. The fluid was turbid, citrine, not viscid, specific gravity 1022, reaction strongly alkaline. No spontaneous coagulation, some by boiling, and the whole mass coagulated on addition of a drop of acetic acid. The coagulum was almost entirely redissolved by boiling with

¹ N. Y. Med. Record, 1882, p. 359.

² L. c., p. 154.

³ L. c., p. 699.

excess of the same agent. The microscope revealed red blood-corpuscles, a few globular bodies with clear fat-granules, like Bennett's large corpuscles, small shreds of connective tissue, fresh endothelial cells, nuclei with shining granules, no ameboid bodies.

Another case is still more interesting, because here an operation (lx.) was performed which allowed to examine the cyst. On the 24th of February, 1882, Dr. Nathan Bozeman extirpated a cyst of this kind weighing ten pounds, seven pounds of which came on the fluid, three on the sac. In this case, the left ovary had been removed by Dr. Thomas three years previously, and the present tumor was taken for a cyst of the right ovary, but this was seen during the operation to be of normal dimensions. The tumors had developed within a year. It consisted of one large cyst occupying about one-half, while the other half was composed of a great number of smaller cysts, many of which communicated with one another through openings in the partitions, which were very thin. The outer walls were likewise very thin in most places, but the main cyst had a wall which was three millimetres thick, and composed of two layers of fibrous connective tissue bound together by some loose connective tissue, exactly like an ovarian cyst. The anterior surface was covered with bridges of tissue belonging to the omentum and supplied with a great many vessels, especially veins. Behind, the tumor was intimately adherent to the small intestine. It had no pedicle. After removal of the large cyst, there was seen a small one, likewise situated in the omentum. It had the size of a chestnut. On the abdominal wall, just above the bladder, were situated three or four dark-colored sessile subperitoneal cysts.

The outer surface was covered with peritoneal endothelium. The inner surface had no epithelium, but, by scraping, a great many round and oval flat cells with a small central nucleus were obtained. They varied much in size, but most of them were about two and one-half red blood-corpuscles in diameter. Cuts from specimens hardened in a one-fourth per cent solution of chromic acid followed by alcohol, showed that the outer parts of the wall consisted of broad stripes of connective tissue, forming a network in whose meshes lay isolated round or oval cells, while the innermost part consisted of similar cells only held to-

gether by very fine fibres. In this inner layer were found numerous arteries.

Cuts taken from that part of the specimen which contained many small cysts showed a similar young connective tissue full of small cells, and contained very much extravasated blood. Cuts from the isolated cyst in the omentum and from the small cysts on the abdominal wall showed a similar structure.

It appears from this description that all these cysts were formed in the meshes of the omentum and the subperitoneal connective tissue. It would seem that blood extravasation plays an important part in their development. The blood is probably gradually changed by serous exudation to a serous fluid; the tissue between two such small compartments breaks down and is absorbed, and the same process repeating itself, large cysts are formed. The abundant cell proliferation furnishes everywhere the material of which the connective tissue is built which forms the wall of growing cysts. It will be noticed how entirely different this mode of cyst growth is from that observed in ovarian and pancreatic tumors. In the omental and subperitoneal cysts the beginning takes place in the meshes of the subserous layer which are devoid of epithelium, while in ovarian and pancreatic cysts the growth begins with the proliferation of the columnar epithelium lining the original cyst, an enlarged Graafian follicle, by which secondary pouches are formed.

The *fluid* was slightly turbid, yellowish-brown, not viscid, of neutral reaction, and had a specific gravity of 1022. In two ounces of fluid two small coagula were formed spontaneously, one of the size of a hazel-nut swam on the top, the other, of the size of a pea lay on the bottom. The surrounding fluid contained only many red blood-corpuscles, some colorless blood-corpuscles, no ameboid bodies, epithelial cells, nor nuclei. The larger coagulum consisted of fibrin with a few blood-corpuscles and some flat roundish cells like those seen in the cyst-wall. The smaller contained very many red blood-corpuscles and few of the other cells. The fluid became almost solid by boiling, but the coagulum was almost entirely redissolved in an excess of boiling acetic acid.

This fluid, then, differed from ovarian, first, by its serous, not viscid consistence, although its color was as deep as dark

urine; second, by its spontaneous coagulation, and, third, by containing flat cells.

23. Ascites.

I. *Simple Ascites*.—The fluid found in the peritoneal cavity in cases of simple ascites due to disease of the liver, the heart, or the kidneys, is, as a rule, so different from that of ovarian cysts that it may be distinguished at the first glance, and a more thorough examination brings out very marked differences. The fluid is of a citrine or a yellow-gray color, clear or slightly turbid, not viscid, and has alkaline reaction. Its specific gravity has in my cases not been so low as generally stated. The lowest I have found, in a case of nephritis (tapped case xii.), was 1012, in the others it has been between 1021 and 1025. Thus this feature cannot be used for a diagnosis.

As a rule, some spontaneous coagulation takes place, showing the presence of *fibrin*. The coagulum may be quite small, not larger than a bean, from two ounces of fluid. Sometimes there is none at all, and on the other hand we have seen that spontaneous coagulation may take place in ovarian cyst fluid.

On boiling, we usually obtain a large and hard coagulum, due to the presence of *albumen*. But sometimes the precipitate is rather scant (tapped cases xii., xxiii.), even on adding a drop of acetic acid.

Boiled with an excess of acetic acid it ought to be unchanged or only become a little yellow, if Scherer's test were correct.¹ In my experience this test has no diagnostic value whatever. Out of six cases of simple ascites, the coagulum remained unchanged in one only (t. c. xii.), was mostly gelatinized in one (t. c. xxiii.), and entirely redissolved in two (t. c. xxix. and op. c. liii.). In the two remaining the test had not been made.

The greenish color is said by Péan² to be due to *biliverdine*, a coloring matter found in the bile. The same author states that *cholesterin* is sometimes found in peritoneal fluid when the collection is old.³ In very rare cases it has been found milky.⁴

While the physical and chemical properties are not to be re-

¹ Thornton in Med. Times and Gazette, May 13th, 1876.

² Tumeurs de l'Abdomen, vol. i., p. 406.

³ Ibid., p. 413.

⁴ Ibid., p. 407.

lied on for a diagnosis, the microscope reveals elements which show with absolute certainty that the fluid in question cannot be ovarian. We find the large roundish *flat endothelial cells* with comparatively small nucleus. Sometimes they are more or less changed, the nucleus disappears and the body undergoing fatty degeneration, contains black dots or shining small globules, or the whole is only an agglomeration of globules (Figs. 34, 58, 59). At other times, flakes of melting endothelium are



FIGS. 58, 59.—Peritoneal endothelium from ascitic fluid, in a state of more or less advanced fatty degeneration.

seen, mostly composed of a thready mass containing free nuclei or small cells (tapped case xxiii.), which are much like epithelial flakes in a similar condition (Fig. 31). Sometimes these cells are seen brown-colored, probably due to coloring matter taken up from the extravasated blood. Columnar epithelial cells are never found, nor are well-developed Bennett's corpuscles, nor nuclei with shining granules.

The second important morphological element are *lymphoid corpuscles*. These are found in very great numbers, and when the fluid is fresh they are seen to move round by ameboid movements (Fig. 60). They are also found imbedded in the



FIG. 60.—Lymphoid corpuscle with ameboid movements, in five consecutive shapes. From ascitic fluid.

fibrinous meshwork, composing the coagulum where one is present. They measure from 6 to 11 μ without the offshoots. These bodies are never found in ovarian fluid.

Besides these, we find smaller bodies without ameboid movements entirely like those represented in Fig. 21 from ovarian cysts. They are probably nuclei set free from melted endothelial cells.

Finally, we find red blood-corpuscles and protoplasmic granules, remnants of larger bodies which have been disintegrated.

Contrary to what is the rule with ovarian fluid, the elements of ascitic fluid are commonly destroyed in a short time.

II. *Cancerous Ascites*.—I have stated in an earlier part of this treatise that I had not been able to find any peculiar characters in the fluid contained in cancerous or other malignant ovarian cysts. I am more inclined to think that the ascitic fluid accompanying cancer of the peritoneum has characters by which it can be recognized. I have only obtained the fluid from four cases of this kind. In one (t. c. xiv.) the fluid was sent to me

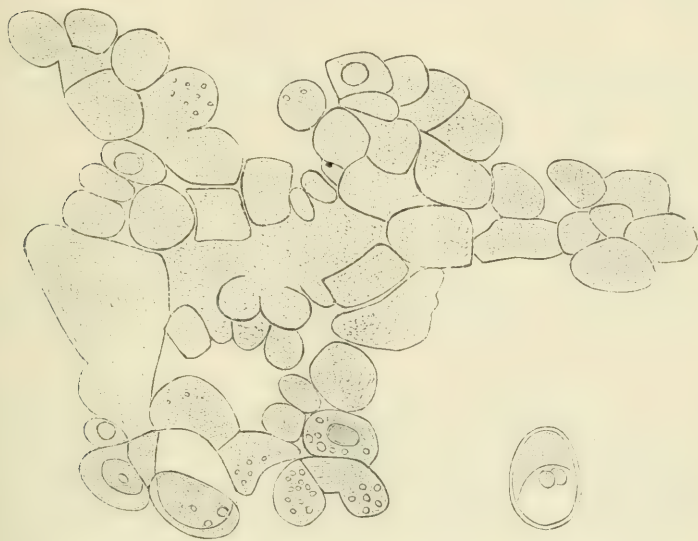


FIG. 61.—Endothelial flake and isolated cell from cancerous ascites.

by Dr. Thomas for diagnosis without the least information about the clinical features of the case. I made the diagnosis of ascites accompanying malignant disease. Dr. Thomas came to the same conviction when on opening the abdominal cavity he found the peritoneum studded with cancerous looking masses. I based my diagnosis, first, on the above-mentioned characters of simple ascitic fluid; second, on the presence of a great amount of red blood-corpuscles and lymph-corpuscles; and, third, on the presence of large groups of endothelial cells of very varying shape and size (Fig. 61).

Dr. Foulis¹ was the first who called attention to the possibility of diagnosing malignant ovarian tumors and malignant peritonitis by the presence of little masses of "sprouting epithelium" found in ascitic fluid surrounding tumors in the abdomen. As far as I know, Dr. Foulis' paper has never been published *in extenso*. We know only its contents from a report of the Transactions of the Medico-Chirurgical Society of Edinburgh. The description there is rather loose and not accompanied by any drawings, nor does the author state what he understands by the vague term of malignant disease.

Thornton,² who seems to have paid a great deal of attention to the character of different abdominal fluids, expresses himself with much greater precision, and gives figures illustrating what he has seen. He defines malignant disease as sarcomas, carcinomas, and certain peculiar ovarian papillomata. He has found his cells and cell-groups as well in ovarian cysts as in ascites. He says that he cannot agree with Dr. Foulis as to their always indicating malignancy when present with an ovarian tumor, as he (Thornton) has found them in the peritoneum when irritated by the rupture of an ordinary ovarian cyst, and as Dr. Keith has operated on patients with the nodular growths, from which he believes these cell-groups are shed, covering the peritoneal surfaces, and yet the patients have remained in good health. Supplementing Foulis, he says, furthermore, that they are not even characteristic of ovarian tumors, since he (Thornton) has found them with malignant disease of the uterus, the liver, and the omentum. Some, says he, look like mere clusters of lymph-corpuscles (like bunches of grapes); others like more or less flattened endothelial plates, arranged in layers, and others present every variety of size and shape, and every stage of growth. It is to these latter he attaches the most importance as indicating malignant disease, and this was one point I took into consideration in making the above-mentioned diagnosis, which proved to be correct.

As for my other cases, the first (i.) was sent from another city, and was perhaps not fresh enough. It contained endothelial cells in fatty degeneration, but no groups. Case xxvii. was sent by Dr. Bozeman, and supposed by him to be cancer of

¹ Foulis in *Edinburgh Med. Journ.*, March and August, 1875.

² Thornton in *Med. Times and Gaz.*, April 10th, 1875, and May 13th, 1876.

the omentum. I diagnosed it easily as ascitic. It contained an abundance of red blood-corpuscles, many of them in the well-known piles, which I have never seen in ovarian cysts. Next there were bodies resembling colorless blood-corpuscles, in a greater number than would correspond with the red. There were, finally, fresh and fatty endothelial cells, but neither in their shape, size, nucleus, nor arrangement did they present anything particular. Was it not cancer, as supposed, or was it cancer without any characteristic epithelial cells? Nobody can tell for sure. I would add that I found one endothelial cell which, being full of pigment granules, had great resemblance with what in ovarian cysts I have called the dark variety of Bennett's corpuscles.

The fluid from case iv., where the autopsy later showed cancer of the omentum, pancreas, and both ovaries, contained very few red blood-corpuscles, a great many colorless lymphoid



FIG. 62. Isolated and grouped epithelial cells from cancerous ascites.

bodies, and large round or pear-shaped endothelial cells, with a large nucleus and nucleolus, both single and in groups (Fig. 62); often with vacuoles. Besides these large cells, measuring 22–27 μ and more, were found quite small ones (Fig. 62 b).

In all other respects, all these malignant fluids showed the properties described in speaking of the simple ascites. The specific gravity varied between 1016 and 1025. The presence of much blood in ascitic fluid is a good sign of malignity, but we have seen that it may be absent. When the fluid contains much blood, it has a red-brown color, but after coagulation has taken place, a more or less clear citrine fluid occupies the upper part of the glass.

Routh¹ has published an article on three cases of “peritoneal tumors,” which belong to this class. They were all taken

¹ Routh in *Obstet. Journ. of Great Brit. and Ireland*, 1874, p. 13.

with more or less certainty to be ovarian. The first gave several pints of dark clear fluid. The autopsy showed cancer of the peritoneum. In the second, the fluid "closely resembled ascitic fluid." The autopsy revealed cancer of the omentum. In the third, forty-five pints of clear green fluid were withdrawn. The autopsy showed cancer of the liver. Even in absence of all chemical and microscopical examination of the fluid, its aspect differed entirely from that of ovarian cysts.

III. *Ascitic fluid mixed with ovarian.* In two cases (operative xxxix. and xlv.), cyst contents had found their way into the peritoneal cavity. Once the cyst was found broken at the operation, and in the other case a small quantity of fluid had been aspirated five days previously, after which the patient had lost two inches in circumference. In these cases, the fluid taken from the peritoneum had some resemblance in general appearance with that taken from the cyst, but differed from it in other respects, showing that the fluid in the cyst had worked as an irritant on the peritoneum.

The endothelium had been thrown off in large flakes (Fig. 34), and undergone fatty degeneration. Ameboid lymphoid bodies were found side by side with columnar epithelial cells. The fluid was clearer and more citrine than the corresponding cyst fluid. It did not coagulate spontaneously in my cases.

Although there was a rent three inches long in the cyst in case xlv., the fluid yet found in the cyst differed in several respects from that found in the peritoneal cavity. The latter was full of lymph-corpuscles with ameboid movements, which were not found at all in the cyst fluid. The peritoneal fluid was clearer, apparently from admixture of serum. In the cyst were found a few nuclei with shining granules, in the peritoneal cavity none. The cyst fluid abounded in columnar epithelial cells seen in side-view, only a few were found in the peritoneal fluid. The epithelial cells seen in front view were all full of fat-drops and not to be distinguished from epithelial cells in a similar condition in an ovarian cyst, but, nevertheless, it is not likely that they were of this kind. If so, we would have found as many in side view as in the cyst, but while there were at least as many seen in front view as in the cyst, there were exceedingly few seen in side view. It is, therefore, probable that the majority were endothelial cells, and that,

through the inflammatory action going on in the peritoneum, these became like columnar epithelial cells of ovarian cysts in a state of beginning fatty degeneration, and seen in front view.

24. *Encysted Peritoneal Collections.*

Under this name I unite all cases of collections of fluid in closed in a kind of new-formed cyst due to adhesions. We have spoken above of Dr. Erich's case which was taken for an ovarian cyst. An examination of the fluid gave a specific gravity of 1030; it was of amber color, did not coagulate spontaneously, and left a thick deposit. A microscopical examination discovered granular bodies corresponding with the ovarian cell described by Dr. Drysdale. It will be seen that the color was one rarely found in ovarian cysts, and that nothing is said about the epithelial cells. Thus it is not unlikely that the fluid might anyhow have been recognized as being not ovarian.

Spencer Wells¹ mentions, in his fourth series of one hundred cases of ovariectomy, a case in which peritoneal fluid was evacuated by a small incision. Cystoid cavity formed by adhering coils of intestine and thickened peritoneum. Since the fluid was "peritoneal" it would have been possible to recognize it beforehand.

Cruveilhier² gives the history of a case where in a duel the celiac trunk was wounded. The patient lived two months. At the autopsy there was found an enormous sac filling the whole pelvis. It proved to be a *blood cyst* containing decolorated fibrin and a great quantity of serum. Although this patient happened to be a man, I mention the case, as showing that the fluid was entirely different from ovarian.

Péan³ says that in *encysted traumatic peritonitis* the contents of the cyst are commonly a sero-sanguinolent fluid the color of which varies, but which has a rather uniform composition. Sometimes it has a reddish tint which suffices to show at the first glance its bloody character. At other times it is clear,

¹ Sp. Wells in Medico-Chir. Trans., Vol. liv., 1871, p. 269, case 5 of exploratory incisions.

² Cruveilhier, Traité d'Anatomie pathologique, vol. iii., p. 518.

³ Tumeurs de l'Abdomen, Vol. i., p. 317.

citrine, and it is only by aid of the microscope that red blood-corpuscles are found. When heated it precipitates a certain quantity of albumen, but it is never viscid or ropy as ovarian fluid.

In several cases the fluid has been found purulent. Péan¹ relates a case in which another physician had withdrawn a red-brown, viscid, semi-solid fluid. At the autopsy was found stinking pus due to a perforation of the intestine. E. Mears,² of Philadelphia, has described a case which was believed to be ovarian. An exploratory incision was made and two gallons of fibrinous pus evacuated. A similar case is reported by Atlee.³

As I have not found a single accurate description of a fluid of this kind which was like ovarian, and as in most of the cases mentioned the mere aspect sufficed to show that it did not come from an ovarian cyst, I conclude that it would be possible by a careful examination to make the differential diagnosis of the fluid.

25. *Tapping.*

Our subject is exhausted, but I feel the necessity, from a practical point of view, to add a few words about the operation by which the fluid is obtained. If my labors shall have a practical value, they must induce operators to have the fluid examined in supposed ovarian tumors before they perform ovariectomy. We have seen that in almost all cases fluid from an ovarian cyst can be distinguished from any other kind of fluid except that of cysts of the broad ligament. Thus there is no doubt about the benefit to be derived in regard to diagnosis from a previous examination of the fluid. The question is only if the operation, by which the fluid is obtained, is in itself so dangerous as to counterbalance the advantages sought.

When ovariectomy began its triumphant course from country to country throughout the world, some enthusiasts, as is usually the case, went so far as to mark the operation of tapping as a crime, their chief argument being that it was not only

¹ Péan in *Gazette médicale de Paris*, 1873, No. 18.

² Mears in *Trans. of College of Physicians, Philadelphia*, 1875, p. 174.

³ *Ovarian Tumors*, p. 160, and *Am. Jour. Med. Sci.*, July, 1872, p. 133.

useless, but prejudicial for the ovariectomy by which it had to be followed. Spencer Wells¹ entirely refuted this aprioristic doctrine by examining his own first three hundred cases. The general mortality was 28.33 per cent. 135 of the patients had never been tapped. In them the mortality was 27.40 per cent, not one per cent less than the general mortality. Furthermore, the mortality of the patients not tapped, though less by about five per cent than that of patients who had been tapped twice, is greater than that of the patients who had been tapped once or three times. The mortality of cases tapped from four to sixteen times was exactly the same as of those who had been tapped only twice. Mr. Wells concludes by saying: "It may be taken then as almost certain that the mortality of ovariectomy is but little affected by tapping. In some of the patients who had been tapped most frequently, there were no adhesions, and there were firm adhesions in some who had never been tapped."

Another objection to tapping, and a much weightier one, is the danger connected with the operation itself of wounding a large vessel or of setting up inflammation. In the second volume of the *Transactions of the American Gynecological Society*² are found six cases of grave trouble attributable to tapping, two of which ended fatally by themselves, and two others after ovariectomy had been performed. In Dr. Lusk's case was found, after death, a quart of grumous blood in the peritoneal cavity. He had only used a fine aspirator-needle, but then the operation had been performed at his college clinic.³ In all the other cases, the untoward symptoms are attributable to infection: septicemia, blood poisoning, peritonitis, inflammation of cyst.

Quite recently⁴ tapping has been attacked by Thornton, Bantock, and Heath, and Bantock said he did not believe at all that septic matter could be introduced through tapping.

There is no doubt that injury may come from tapping, but

¹ Sp. Wells in *Trans. Med. Chir. Soc.*, Vol. lii., 1869, p. 206.

² Goodell in *Transact. Am. Gyn. Soc.*, ii., p. 265 seq.

³ For the information of possible European readers, I must add that this word in this country has entirely lost its original meaning, of hospital wards where patients are lying in bed (*κλινη*).

⁴ *Lancet*, January 15th, 1881; *Am. Journ. Med. Sc.*, April, 1881, p. 580-583.

as a set off we must remember that great evil has resulted from not tapping. Numbers of times the peritoneal cavity has been opened, and not always with the precaution to proceed as if it were a mere exploratory incision, when the most divers pathological conditions have been found instead of the supposed ovarian cyst. There is no doubt in my mind that the deaths brought about in this way, and which might have been avoided by examining the fluid beforehand, greatly exceed those referable to tapping. In this category we would not find two or three deaths, but as many dozens if we would search the printed records, and still more if we could supplement the list by those which have not been published.

There might be adduced a third reason for abstaining from tapping, namely, that it is superfluous. In the preceding pages we have seen tumors of the kidney, the spleen, the pancreas, and the omentum, which had been taken for ovarian cysts, successfully operated on. To this I would answer that many surgeons, who are willing to perform ovariectomy would not like to grapple with these rare and, as a rule, more difficult cases. All patients cannot be brought to New York, London, Paris, or Berlin, to be treated by the most skilful operators commanding every instrument, appliance, or arrangement which may contribute to a favorable issue. The great majority of surgeons will prefer to know beforehand if they have to deal with an ovarian cyst or not.

Anyhow, the fact remains that tapping is an operation by which the patient's life may become endangered. It ought, therefore, to be performed with the same care as any other capital operation, and everything ought to be done in order to diminish the dangers inherent in it. First of all, it ought never to be done otherwise than with antiseptic precautions. By this term I do not think of the spray, which is entirely superfluous in this operation, but the instruments have to be not only clean, but kept immersed in a five-per-cent carbolic solution or in alcohol for at least five minutes before being used. The abdomen of the patient has to be washed first with soap and water, and then with carbolized water of at least 2.50 per cent. The excellent experiments of Wegner¹ have shown that the air in itself, when brought in contact with

¹ Wegner in *Archiv für klinische Chirurgie*, vol. xx., p. 91-98.

the peritoneum, does no harm. The mechanical injury caused by a small instrument is so slight that the risk is exceedingly small of producing inflammation in this way. But from decomposing organic material adherent to the instruments, or to the skin of the patients, comes the danger of septic inflammation or septicemia.

The danger of wounding blood-vessels cannot be avoided, but can be much lessened by the use of a thin instrument, by not plunging it too abruptly into the tumor to be examined, and by keeping the patient quiet after the operation.

Tapping ought never to be performed in the office or on outdoor patients calling at a hospital. It ought to be done antiseptically. An aspirator with a canula, not exceeding two millimetres in width, is preferable to a larger trocar. Aspiration takes sometimes much more time than to perform ovariectomy, but when the life of our patient is at stake, time ought not to come into consideration.

The whole collection of fluid contained in the compartment opened ought to be withdrawn. Else the fluid left may work its way out into the peritoneum and set up peritonitis. From this rule only fibro-cysts of the uterus are to be excepted. In these the evacuation of the tumor, the walls of which are commonly too unyielding to collapse, has proved very deleterious. If, therefore, the clinical features of the case make it likely that the surgeon has to deal with a cyst of this description, and if the fluid seems to corroborate his view, he had better withdraw only a couple of ounces, which will afford the opportunity of a chemical and microscopical examination.

After any aspiration, the patient ought to be kept in bed for four days.

These are the rules I have followed myself, and by using such precautions, I feel confident that untoward accidents attributable to tapping will become exceedingly rare, and that the chances of benefit to the patient are much greater by making sure of the diagnosis by a thorough examination of the fluid, than the risk incurred by the previous aspiration. Nevertheless, it is perhaps not advisable to tap a cyst unless ovariectomy can be performed if required. If inflammation sets in, the proper course to be pursued is to perform ovariectomy immediately.

26. *Conclusions.*

1. The examination of the fluid from abdominal tumors affords a very valuable aid to diagnosis. By studying the physical, chemical, and microscopical characters it is almost always possible to diagnosticate ovarian cysts, even without knowing anything about the patient, and of course still more so when the result is combined with the other features of the case.

2. The *physical characters* give myxoid ovarian fluid in most cases a certain appearance by which it is recognized at once.

3. The *viscosity* is the most important physical character when present, but may be wanting in ovarian, and present in non-ovarian fluid.

4. The higher *specific gravity* may be of some use in distinguishing ovarian fluid from that of a cyst of the broad ligament. In the differential diagnosis between ovarian cysts and ascites it has only some value in extreme cases.

5. The color, limpidity, odor, and reaction are not characteristic.

6. No *chemical* product peculiar to ovarian fluid has been found.

7. *Coagulation.* As a rule, ovarian fluid does not coagulate spontaneously, and when it does, the coagulation takes place slowly. Ascitic fluid as a rule coagulates spontaneously and slowly, forming a small coagulum. The fluid of uterine fibrocysts does sometimes coagulate, and then in a mass and immediately (see below). In a case of sarcomatous tumor (case xxvi.: osteo-myxochondro-sarcoma of the os ilium) a large clot was formed by being exposed to the air.

8. Ovarian fluid coagulates as a rule to a great extent or entirely by heat.

In two cases out of three of cysts of the broad ligament, this coagulation did not take place. The third was not tested in this respect.

9. *Scherer's test for paralbumen.* In most cases the coagulum formed by boiling alone or with a drop of acetic acid to counterbalance alkalinity was more or less completely redissolved by boiling with the same reagent in excess. But the test is not reliable. Some ovarian fluids were little or not at

all changed, and in some tapped cases which decidedly were not cystic, but ascitic, complete redissolution of the coagulum took place.

10. In ovarian fluid, the histological elements are as a rule preserved for a more or less long time (weeks or months). Not so with the fluid from ascites, and from cysts of the broad ligament. When present, this character has diagnostic value, its absence none.

11. The *microscopical* examination is of much greater importance than the physical and chemical (inclusive of spectroscopy).

12. It is only by studying the cyst-walls and especially by tracing the formation of cysts back to its very beginning that we can come to understand the fluid they contain.

13. Fluids ought to be examined as fresh as possible, for though ovarian fluid often may be recognized after months, sometimes it is not the case, and other fluids are often changed very soon, larger bodies being broken down to granules or altogether dissolved, and movements arrested.

14. The bodies seen in ovarian fluid are red blood-corpuscles, epithelial cells, nuclei, granules, pigment, finely granular globular bodies like lymph-corpuscles or colorless blood-corpuscles, pus-corpuscles, spindle-shaped cells, colloid masses, cholesterin and indican.

15. The epithelial cells are columnar.

16. In one case were found corpuscles with ameboid movements.

17. Bennett's large corpuscles are epithelial cells in fatty degeneration.

Another kind which I call the dark variety of Bennett's corpuscles are epithelial cells filled with pigment.

18. Bennett's small corpuscle, Drysdale's "granular ovarian cell," is no cell, but the nucleus of an epithelial cell in a state of fatty degeneration.

19. The small bodies with dark granules so common in ovarian fluid are likewise nuclei of epithelial cells.

20. There is no pathognomonic morphological element in ovarian fluid.

21. The most important element in regard to diagnosis are columnar epithelial cells seen in side view. Their presence

excludes all other tumors than those of the ovary, Fallopian tube, and broad ligament (perhaps with the exception of a cyst of the pancreas).

22. Bennett's corpuscles, Drysdale's corpuscles, nuclei with dark granules, and cholesterin have no diagnostic value.

23. Cysts of the broad ligament cannot be distinguished from those of the ovary.

24. John Hughes Bennett, of London, was the first who described and delineated both the large and the small granular bodies commonly found in ovarian cysts and noticed that the latter have no nucleus, not even after addition of acetic acid.

25. Eichwald was the first to mention the presence of colloid globules, horn-cells, cholesterin, and pigment.

26. Waldeyer was the first who pointed out the presence and diagnostic value of the columnar cells.

27. If a fluid contains hair or epidermal scales, or is composed of melted fat, it is *dermoid*, but nothing shows that it is ovarian. Sometimes dermoid ovarian cysts contain a fluid like that of myxoid cysts. Sometimes both these classes of characters are combined, and then the diagnosis of dermoid ovarian cyst can be made.

28. A fluid as clear as water and containing very few histological elements and without nuclei with shining granules (Drysdale's "ovarian cells") may be found in ovarian cysts, both true monocysts (hydrops folliculi), and multilocular cysts with ciliated epithelium.

29. Neither the quantity, nor the size, nor the shape, nor the arrangement of the elements found in cystic fluid enables us to tell that the cyst is sarcomatous, or carcinomatous, but only that it is ovarian.

30. *Cysts of the broad ligament* are much rarer than ovarian cysts.

31. Both ovarian cysts and cysts of the broad ligament may have serous or colloid contents, but the latter is common in ovarian cysts, rare in extraovarian cysts, while watery fluid is common in extraovarian, rare in ovarian cysts.

32. *Uterine fibro-cysts* are very rare. All cases in which a sufficiently large quantity of fluid was withdrawn and coagulated spontaneously, promptly and completely, have proved to

be fibro-cysts of the uterus. But coagulation takes only place in the fluid from a minority of uterine fibro-cysts.

The presence of a fluid which, after a long exposure to the air, precipitates fibrinous clouds, or which gelatinizes on addition of blood or serum, does not prove that it comes from a fibro-cyst.

33. Atlee's fibre-cell is not always found in uterine fibro-cysts, and may be present in ovarian cysts.

34. None of the other microscopical elements, more or less changed epithelial cells, found in uterine cysts have any diagnostic value.

35. Columnar epithelial cells are never found in uterine cysts.

36. *Amniotic fluid* is entirely different from ovarian. It contains large flat epidermal scales full of fat and free fat masses.

37. It is doubtful if the fluid of *dropsy of the Fallopian tube* can be distinguished from that of ovarian or uterine cysts, or those of the broad ligament. But tumors of this kind, large enough to call for surgical intervention, are exceedingly rare, and can be removed so that no harm would arise from an erroneous diagnosis.

38. A fluid like that of lymphectatic uterine tumors, which coagulates promptly in a mass on exposure to air, has been found in a tumor of the same kind developed in the round ligament.

39. *Cysts in the abdominal wall* may occasionally become so large as to simulate ovarian cysts. The fluid differs from that of ovarian cysts by being limpid, serous, lemon-colored, and devoid of epithelial cells, or their derivata.

40. The fluid from *urachus cysts* differs from ovarian fluid by containing *flat* epithelial cells.

41. Cases of *spina bifida* have formed a tumor in the pelvis which had the appearance of an ovarian cyst. The fluid contained no albumen nor any histological elements, and might have been recognized as non-ovarian.

42. A single hooklet or the smallest piece of cuticula is pathognomonic for *echinococci*, but they are not always found in the fluid coming from these tumors. It is without albumen or contains only traces thereof, but this may also be the case with

ovarian cysts. It contains succinic acid, leucin, grape-sugar, inosit, none of which have ever been found in ovarian cysts. Uric acid and urea have been found in both kinds. Paralbumen has never been found in echinococci. Thus the differential diagnosis can be made by chemical and microscopical examination.

43. *Cysts of the mesentery* can be distinguished from ovarian by containing serous fluid without epithelial cells.

44. *Cysts of the spleen* are of so rare occurrence that only a single one is on record. It might have been recognized as non-ovarian by the fluid which, although it was thick, viscid, yellowish-brown, full of albumen, *leucocytes*, and cholesterin, did not contain any epithelial cells nor their derivata.

45. *Cysts of the liver*, when we except echinococci, are likewise very rare. The fluid differs from that of ovarian cysts by the absence of the characteristic elements and probably of paralbumen, and sometimes by containing bile or liver-cells.

46. *Hydronephrosis* may sometimes be differentiated from an ovarian cyst by the presence in the fluid of a large quantity of urea, flat epithelial cells, and by its acid reaction. A small amount of urea may be found in both. Likewise has paralbumen been found in hydronephrosis. When no kind of epithelial cells are found, and the chemical composition is not characteristic, the diagnosis may be impossible.

47. *Renal cysts* of large size are rare. Their contents may be very like those of ovarian cysts, especially be full of nuclei with shining granules, and form a coagulum by heat which is redissolved by boiling acetic acid in excess. The macroscopical appearance is not characteristic. Sometimes urea in large proportions and uric acid are present which settles the differential diagnosis, but at other times there is none. Sometimes flat epithelial cells are found, at other times the characteristic short columnar or cubic epithelial-cells as found in the urine of patients suffering from catarrhal nephritis. The long columnar epithelial-cells found in ovarian cysts are never found in renal cysts. By these different properties it will probably always be possible to differentiate them.

48. A *cyst of the pancreas* built exactly like an ovarian cyst, contained a fluid differing from ovarian by the acid reaction,

the uniform, small size of the nuclei, and the presence of peculiar thready bodies.

49. The fluid from a large *cyst of the omentum* differed from ovarian by being serous, not viscid, although it was dark; by spontaneous formation of small coagula, and by containing flat interstitial cells.

50. *Ascites* can sometimes be recognized by mere inspection. The specific gravity cannot be used for a diagnosis. As a rule, some spontaneous coagulation takes place, but sometimes not. On the other hand, ovarian fluid may coagulate spontaneously. Scherer's test for paralbumen has no value for the differential diagnosis. It can always be made by the microscope, showing flat endothelium and ameboid lymph-corpuscles.

51. *Ascites* arising from cancer of the peritoneum differs perhaps from simple ascites by containing large round or pear-shaped endothelial cells with large nucleus, either isolated or in groups. It differs from ovarian fluid by the same characters as simple ascites.

52. *Ascitic fluid mixed with ovarian* is full of endothelial cells and flakes which undergo fatty degeneration. Ameboid lymphoid bodies are found together with columnar epithelial cells. It did not coagulate spontaneously in my cases. Even when there is a long rent in a cyst, the fluid inside and outside the cyst may be different.

53. *Encysted peritoneal collections* differ commonly by their mere aspect which is like ascitic fluids from ovarian. The fluid is never viscid. Bodies like Drysdale's ovarian cell have indeed been found in them, but never columnar epithelial cells. If purulent, these fluids can perhaps not be distinguished from that of an ovarian cyst which has been suppurating for some time.

54. The danger connected with performing operations for supposed ovarian cysts which turn out to be other diseases is much greater than that arising from tapping with proper precautions.

55. The instruments ought to be immersed in a five-per-cent carbolic solution or in alcohol for at least five minutes.

The abdomen of the patient ought to be washed with soap and water and then with carbolized water. The danger of

causing hemorrhage is much lessened by using a thin instrument and by pressing it slowly into the tumor. Aspiration is preferable. The compartment of a cyst which has been opened ought to be entirely emptied, except if it is a uterine fibro-cyst.

Aspiration ought never to be performed in the office or outdoor departments, and after the aspiration the patient ought to be kept in bed for four days. The possibly arising indication for ovariectomy within twenty-four hours ought to be kept in the mind.

27. *Appendix.*

Material not used in the Preceding Chapters.

I add a few remarks on some of the fluids found in tapped cases and not used for the preceding chapters.

Case IX. *Fluid from Thoracic Cavity.* Citrine, clear, not viscid. Specific gravity 1014. No odor. Alkaline reaction. Small coagulum on bottom of vessel. Some precipitation by heat, more by adding a drop of acetic acid, cleared up by excess of boiling acetic acid. Microscopical elements: Lymph-corpuscles, some with ameboid movements, flakes of endothelium composed of angular cells twelve to sixteen μ in diameter, each with a nucleus, red blood-corpuscles. The coagulum, tough, elastic, composed of fibrin crowded with lymph-corpuscles and endothelial cells.

Case XIII. *Hydrocele.* 15 fluid \bar{z} , light-yellow, clear, much like urine, not viscid, specific gravity 1027, no odor, alkaline reaction, no spontaneous coagulation, became one solid mass on boiling, unchanged by boiling acetic acid in excess. Morphological elements: red blood-corpuscles, ameboid lymphoid cells, flat endothelial cells with large protoplasmic granules; on addition of acetic acid they showed a large round or kidney-shaped nucleus.

Case XXI. *Congenital Cyst of Neck of a little Child.* Fluid light yellowish-gray, alkaline, not viscid. Quantity too small for other tests. Microscopical elements: Hematoblasts, red blood-corpuscles, breaking down flat epithelial cells, leaving a round, colorless nucleus, small free nuclei, indican.

Case XXXI. *Blisters from Scalding.* Citrine, clear, alkaline fluid, no spontaneous coagulation, contains a few flat

epidermal scales, a few red blood-corpuscles, and a large number of spheric slightly granular cells, one and a half red blood-corpuscles in diameter, with or without nucleus, not changed by acetic acid.

Case XXXIII. *Congestive Abscess of Femur* of five years' standing. Tumor in Scarpa's triangle as large as head of adult. Fluid yellowish, turbid, viscid, alkaline, aromatic, separates on standing in an almost clear upper part, and a deposit measuring one-third of the whole, full of glistening cholesterin; did not coagulate spontaneously, but entirely by boiling, coagulum not changed by excess of boiling acetic acid. Microscopical elements: red blood-corpuscles, cholesterin, spherical or slightly polyhedral cells with single, rarely double nucleus and fat-globules in corpus, eleven to twenty-two μ in diameter, many nuclei with shining granules. None of these cells were like any kind of epithelial cells, but were mere indifferent cells undergoing fatty degeneration or melting. Acetic acid dissolved the body and left the nucleus free. The nuclei with shining granules were only cleared up a little.

The fluid had neither macroscopically nor microscopically the appearance of pus, but similar cells were found in large number in a case of vaginal cyst I have examined.

I need scarcely add that none of these fluids resembled those found in ovarian cysts.

A.—Operative Cases.

NUMBER.	DATE.	OPERATOR.	DIAGNOSIS.
	1880.		
I.	Feb. 21	Thomas.....	Myxoid proliferous glandular cystoma of ovary.
II.	Feb. 21	Thomas.....	Myxo-dermoid proliferous glandular cystoma of ovary.
III.	Feb. 21	Thomas.....	Myxoid proliferous glandular cystoma of ovary.
IV.	Feb. 26	Noeggerath....	Suppurating ovarian cyst.
V.	Feb. 28	Thomas.....	Cyst of broad ligament.
VI.	Mar. 12	Bozeman.....	Myxoid proliferous glandular cystoma of ovary with ciliated epithelium and external papillomas.
VII.	Mar. 18	C. C. Lee.....	Suppurating cyst of abdominal wall.
VIII.	Mar. 20	Thomas.....	Myxoid proliferous papillary cystoma of ovary.
IX.	Mar. 26	Thomas.....	Cystic fibro-sarcoma of ovary.
X.	April 3	Thomas.....	Myxoid proliferous glandular cystoma of ovary.
XI.	April 17	Thomas.....	Cyst of broad ligament.
XII.	April 28	Thomas.....	Ditto.
XIII.	May 4	Bradt. (Autop.)	Medullary carcinoma of ovarian cyst.
XIV.	April 19	Dawson.....	Beginning cystic degeneration of ovaries. Oöphorectomy.
XV.	May 15	Thomas.....	Myxo-fibromatous cyst of ovary.
XVI.	Aug. 21	Bopp.....	Myxoid proliferous glandular cystoma of ovary.
XVII.	Sept. 23	Thomas.....	Ditto.
XVIII.	Sept. 25	Thomas.....	Myxoid proliferous papillary cystoma of ovary.
XIX.	Sept. 28	B. Emmet.....	Myxo-dermoid proliferous glandular cystoma of both ovaries.
XX.	Oct. 2	Thomas.....	Carcinomatous cystoma of ovary.
XXI.	Oct. 5	Bopp.....	Myxoid proliferous glandular cystoma of ovary.
XXII.	Oct. 10	Thomas.....	Myxo-dermoid proliferous glandular cystoma of ovary.
XXIII.	Oct. 15	Bozeman.....	Myxoid proliferous glandular cystoma of ovary.
XXIV.	Oct. 18	Noeggerath....	Ditto.
XXV.	Oct. 19	Bopp.....	Ditto of both ovaries.
XXVI.	Oct. 20	Adier.....	Cystic osteo-myxo chondro-sarcoma of the iliac fossa.
XXVII.	Oct. 23	Thomas.....	Myxoid proliferous glandular cystoma of ovary.
XXVIII.	Oct. 26	T. A. Emmet...	Ditto.
XXIX.	Oct. 29	Bozeman.....	Ditto. Beginning carcinoma.
XXX.	Nov. 4	T. A. Emmet...	Myxoid proliferous glandular cystoma of ovary.
XXXI.	Nov. 6	Thomas.....	Ditto.
XXXII.	Nov. 6	Thomas.....	Myxoid proliferous papillary cystoma of ovary.
XXXIII.	Nov. 13	Thomas.....	Hydrops of Graafian follicle. True monocyst.
XXXIV.	Nov. 17	Garrigues (Autopsy).	Myxoid proliferous glandular cystoma of ovary.
XXXV.	Nov. 19	Bozeman.....	Ditto.
XXXVI.	Nov. 20	Thomas.....	Ditto.
XXXVII.	Nov. 23	Noeggerath....	Ditto.
XXXVIII.	Dec. 1	Dawson.....	Suppurating ovarian cyst.
XXXIX.	Dec. 3	Bozeman.....	Myxoid proliferous glandular cystoma of ovary.
XL.	Dec. 10	Bozeman.....	Myxoid proliferous papillary cystoma of ovary.
XLI.	Dec. 11	Thomas.....	Cystic fibro-sarcoma of ovary.
XLII.	Dec. 14	T. A. Emmet...	Myxoid proliferous glandular cystoma of ovary. Beginning carcinoma.
XLIII.	Dec. 17	Bozeman.....	Myxoid proliferous glandular cystoma of ovary.
XLIV.	Dec. 20	J. B. Hunter...	Ditto.
XLV.	Dec. 28	T. A. Emmet...	Ditto.
	1881.		
XLVI.	Jan. 8	Thomas.....	Ditto.
XLVII.	Jan. 15	Thomas.....	Ditto.
XLVIII.	Feb. 19	Thomas.....	Cysto-sarcoma of ovary.
XLIX.	Feb. 19	Thomas.....	Ditto.
L.	Mar. 5	Thomas.....	Myxoid proliferous glandular cystoma of ovary.
LI.	Mar. 18	Bozeman.....	Proliferous papillary cystoma with ciliated epithelium.
LII.	Mar. 26	Thomas.....	Myxoid proliferous papillary cystoma of ovary.
LIII.	April 9	Thomas.....	Uterine fibro-cyst (myoma lymphangiectodes).
LIV.	April 11	J. B. Hunter...	Myxoid proliferous glandular cystoma of ovary.
LV.	April 14	T. A. Emmet...	Ditto.
LVI.	April 30	Thomas.....	Ditto.
LVII.	April 30	Thomas.....	Ditto.
LVIII.	Oct. 15	Thomas.....	Renal cyst.
LIX.	Dec. 2	Bozeman.....	Pancreas cyst.
	1882.		
LX.	Feb. 24	Bozeman.....	Cyst of omentum.

B.—Tapped Cases.

NUMBER.	DATE.	OPERATOR.	DIAGNOSIS.	REMARKS.
I.	1880. Feb. —	H. K. Bennett...	"Cancer of omentum and peritoneum."	Autopsy.
II.	Mar. —	Unknown.....	"Abdominal tumor in a man."	
III.	April 1	Polk.....	"Ascites from cardiac and Bright's disease."	
IV.	April 26	Gillette.....	Carcinoma of omentum, pancreas and ovary.	Autopsy. Operative Case XIII.
V.	April 30	Bozeman.....	Cyst of broad ligament (or ovary).	
VI.	April 28	Thomas.....	Ditto.	
VII.	May 1	Thomas.....	Ditto.	
VIII.	May 5	Ripley.....	"Ascites from cirrhosis of liver in male."	
IX.	May 7	Ripley.....	"From thoracic cavity."	
X.	May 5	Mundé.....	Cyst of ovary (or broad ligament).	
XI.	May 16	Bozeman.....	Cyst of broad ligament (or ovary).	Operative Case XXIII. (ovarian).
XII.	May 18	N.S.Cheesman...	"Ascites from nephritis in male."	
XIII.	Aug. 19	Garrigues.....	Hydrocele.	
XIV.	Sept. 21	Thomas.....	Ascites from malignant disease.	Diagnosis confirmed by laparotomy.
XV.	Oct. 4	Garrigues.....	Ovarian cyst.....	Op. Case XXXVII.
XVI.	Oct. 17	Gillette.....	Cyst of ovary (or broad ligament).	
XVII.	Nov. 3	Thomas.....	Cyst of ovary (not uterine).	Op. Case XXXI.
XVIII.	Nov. 11	Thomas.....	"Ovarian cyst."	
XIX.	Nov. 12	Bozeman.....	Ascites (fluid decomposed)....	Clinical diagnosis obtained later: ascites from cancer of omentum.
XX.	Nov. 12	Bozeman.....	Cyst of ovary (or broad ligament).	Operative Case XL. (ovarian).
XXI.	Nov. 12	Oberndorfer....	"Congenital cyst of neck in a child."	
XXII.	Nov. 16	Thomas.....	"Ovarian cyst.".....	Sent after ovariectomy.
XXIII.	Nov. 22	A. Lowenthal....	"Ascites from cirrhosis of liver."	
XXIV.	Nov. 24	Garrigues.....	Ovarian cyst.	
XXV.	Nov. 28	Bozeman.....	Cyst of ovary (or broad ligament).	Op. Case XXXIX. (ovarian).
XXVI.	Nov. 29	Dawson.....	"Ovarian cyst.".....	Operative Case XXXVIII.
XXVII.	Dec. 17	Bozeman.....	"Ascites from cancer of omentum."	
XXVIII.	1881. Jan. 12	Garrigues.....	Liquor amnii.	
XXIX.	Jan. 24	J. B. Hunter....	Ascites.	
XXX.	Feb. 15	Bozeman.....	Cyst of ovary (or broad ligament).	Operative Case LI. (ovarian).
XXXI.	Mar. 21	Garrigues.....	Blisters from scalding.	
XXXII.	April 23	Noeggerath.....	"Renal cyst".....	Obtained by laparotomy.
XXXIII.	May 3	Gerster.....	"Congestive abscess of five years' standing."	Extirpation attempted.
XXXIV.	May 9	Mundé.....	Cyst of ovary (or broad ligament).	
XXXV.	May 21	Garrigues.....	Cysto-sarcoma of ovary....	
XXXVI.	June 15	Garrigues.....	Cyst in omentum with cancer.	
XXXVII.	Sept. 10	Robt. Townshend	"Liver cyst" (?).	Autopsy.

THE EFFECTS OF ANTE-DISPLACEMENTS OF THE UTERUS ON PREGNANCY AND LABOR.

BY

EUGENE C. GEHRUNG, M.D.,
St. Louis.

(With six woodcuts.)

CONSIDERABLE attention has of late been paid to the morbid effects of retro-displacements of the uterus on gestation, while those of ante-displacements on gestation and parturition have been almost completely ignored. This paper is intended partly to remedy the omission, and to urge the closer study of this subject.

Since the character and space of this paper do not permit me to enter upon a discussion of the correctness or incorrectness of the present definition of the different uterine displacements, I shall show by diagrams what I mean by the words anteflexion and retroverted anteflexion.

Ante-displacements of the uterus may be divided into four principal varieties:

1st. Anteversion.

2d. Anteflexion, *i. e.*, flexion of the corpus on the cervix, the latter retaining its normal relation to the surrounding pelvic organs, thus:

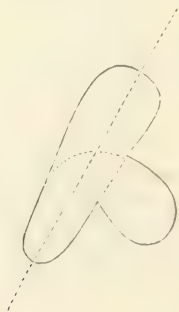


FIG. 1.

3d. Anteflexion complicated with retroversion, or, *vice versa*, retroversion complicated with anteflexion, thus:

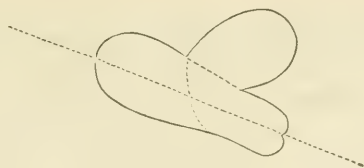


FIG. 2.

4th. Retroposed anteversion.

Besides these, there are several sub-varieties, as anteversion with lateral rotation, antelatero-flexions, antelatero-versions, all of variable degrees of intensity.

The second variety (anteversion) particularly forms the subject of this paper, while the other varieties, though not devoid of importance, will, for the sake of brevity, remain here unnoticed. It will be left to the intelligence of the reader to conjecture how much or how little these may lay claim to what is here credited to the second variety.

The normal unimpregnated womb presents its anterior surface towards the symphysis pubis and anterior wall of the abdomen. After conception, the organ grows in length and breadth, which soon brings it in contact with the anterior abdominal wall, as well by means of its growth as by the assistance of those check-lines, the round ligaments. As it develops, it is thus safely guided along the smooth and unobstructed anterior division of the abdominal cavity to the ensiform cartilage. Every part of the organ, except the cervix, develops nearly equally to form the large receptacle necessary for the maturing fetus.

The picture is, however, considerably changed with those not infrequent cases of the second variety, namely, anteversion. In these, the body of the uterus is flexed upon the neck, the neck is pulled back and upward, while the body is thrown forwards and downwards, so much so, as to present the fundus and frequently a greater or lesser part of the posterior surface of the corpus towards the pubic symphysis and the anterior abdominal walls. If such a uterus becomes the receptacle of a fecundated ovum, it expands in all directions as long as there is space for it to do so.

As soon as the space of the small pelvis is filled, the growth ceases to be general, and, in the absence of the inclined planes

of the anterior walls of the uterus and abdomen, the fundus cannot, as in the former case, be pushed up foremost towards the epigastrium. On the contrary, as friction increases by the growth of the uterus, the fundus will become more firmly fixed, at least for a shorter or longer time, in its abnormal position near the pubes, and some point of the posterior wall of the uterus is pushed upwards and made to act as a pseudo-fundus. In other words, the posterior wall of the uterus alone, or, at least, to a greater or lesser extent, furnishes, by overgrowth, the substance for the enlarging womb, while the true fundus remains at or near its abnormal site, and the anterior wall of the uterus assists comparatively little in the longitudinal development, while it favors lateral expansion. (See Figs. 3 and 4.)



FIG. 3.



FIG. 4.

FIG. 3.—Development of the normal pregnant uterus.

FIG. 4.—Probable mode of development of the ante-flexed uterus.

The preceding remarks do not apply with equal force to all cases of this displacement. In some of them, almost complete restitution by the unaided efforts of nature takes place, while in others there will be little or no replacement. Between the two extremes, there are, of course, many degrees.

This vicious mode of development of the ante-displaced womb may be, and is, the partial or whole cause of a great variety of complications during gravidity and parturition. The discussion of its relation to sterility, dysmenorrhea, etc., does not come within the pale of this paper.

This abnormal evolution is the cause :

1st. Of the persistence of the malpositions or contortion during the whole pregnancy.

2d. Of the almost invariable return or persistence of the old displacement after involution.

3d. It may be the cause of subinvolution, and the host of consequences of the latter.

4th. It can, and must, be at times the cause of so-called transverse and oblique positions (shoulder presentations) of the fetus, on account of the great impediment to longitudinal development accompanied by an increased facility to bilateral (*i. e.*, transverse) development.

5th. It is, according to the degree of laxity of the abdominal walls, the cause of "hang belly;" *i. e.*, anterior obliquity.

6th. It is undoubtedly often the cause of miscarriage, on account of the great resistance thus offered to the natural development of the womb, and the increase of the flexion, in proportion to the growth of that organ during the early months of pregnancy.

7th. Its occasional relation to the causation of vomiting and other complications of pregnancy can certainly not be denied, if observation entitles one to draw conclusions.

8th. It is the cause of "sacculation" of the womb (in which the internal os and anterior wall of the cervix form an almost insurmountable barrier, preventing the presenting part that rests in a sac anterior to the cervix from engaging into its canal), though this condition has been ascribed by Depaul, Barnes, and others to retroflexion.

9th. It is a frequent cause of protracted labor for two reasons, *viz.* :

(*a*) Because the presenting part does not rest on the internal os and cervix, as in the normal position of the gravid uterus, but anterior to these in a depression of the anterior wall.

(*b*) Because the axis of the fetus and the true axis of the womb, and consequently the direction of the expulsive pains, do not correspond. Many hours of labor pains are often lost in the attempt to bring about this axial correspondence, not to speak of the suffering from false or preliminary pains. See Fig. 6, AB.

While writing this paper, a young unmarried woman presented herself to me with a card from a physician of this city, requesting me to examine her and report the result. Besides a large rectocele, varicosity of the vulva and vagina, I found her pregnant at about the seventh month. The uterus was completely anteflexed, the cervix high up in the sacral concavity, and pointing downward, while anteriorly and separated by a deep sulcus was the anterior wall of the uterus, if not the fundus, through which could be felt the head of the fetus, somewhat to the right of the middle line. The breech could be felt high up in the left hypochondriac region; the dorsum presenting almost completely laterally towards the left ilium. The heart-beats could be made out

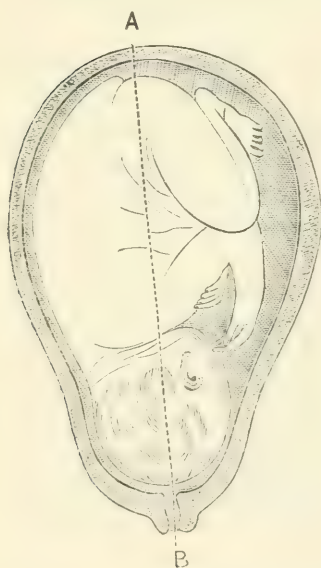


FIG. 5.

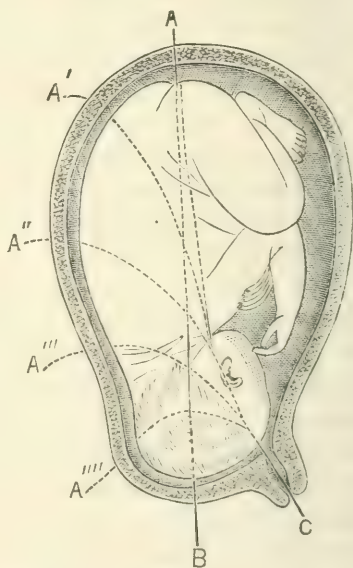


FIG. 6.

FIG. 5.—AB, Axis of expulsion and of pain wave.

FIG. 6.—AB, necessary axis of expulsion; AC, true axis of expulsion; A'C, A'''C, A''''C or A''''C may represent the true axis of the pain wave, according to the position of the fundus.

with some difficulty near and below the anterior superior spine of the ilium. On attempting ballotement, the head would easily slip over to the right iliac fossa, and on passing up my finger anteriorly to the almost floating head, I could distinctly make out what I believed to be the right shoulder. The outline of the apparent fundus of the womb, instead of the normal shape, was like that seen in Fig. 6.

The position of the fetus was distinctly oblique, with a very great tendency to become transverse, and if nothing is done to

prevent it, a shoulder presentation may be looked for with almost absolute certainty.

This teaches that, contrary to the attempts of men high in the profession to consider forward displacements as innocent, these displacements should be studied much more carefully in their bearing on pregnancy, miscarriage, fetal position, and labor than they have been studied heretofore; that when found present no effort should be spared to elevate the fundus by the best means at our disposal, and induce the uterus to present its anterior wall forwards instead of downwards, so that it may glide up as it grows along the anterior abdominal parietes, like a normal uterus would do.

The resistance against replacing the ante-displaced pregnant womb is often much greater than any one who has not experienced the difficulties would credit. My experience teaches me that the statement made, even in the latest works on obstetrics, that ante-displacements of the gravid uterus will be corrected by the advancing pregnancy, must be a mistake, except it be by Nature's substitutes, as described above.

A well-fitted anteversion pessary, as Thomas' cup, Hewitt's saddle, or the writer's double horseshoe, carefully watched that the fundus may not insinuate itself between the pessary and the abdominal walls, will generally suffice to correct the displacement during the first four months of gestation, so that by the time the uterus becomes self-sustaining, its anterior walls and that of the abdomen will be in juxtaposition. If a case comes under observation at a later period, even then pessaries may be used with advantage, though frequently repeated reposition by conjoined manipulation should be principally relied on. This is done by one or two fingers in the vagina, assisted by the free hand through the abdominal walls, gently pushing up the fundus until the anterior surface of the womb looks forward; then apply the fingers behind the cervix and pull this gently towards bladder and pubes, while making counter-pressure on the fundus and anterior face of the uterus from without.

A CASE OF ANTE-PARTUM HOUR-GLASS CONTRACTION OF
THE UTERUS.

BY

GEORGE M. HAINES, M.D.,

Durand, Ill.

ON reading Dr. Smith's paper on the above subject in the April number of the JOURNAL OF OBSTETRICS, I am prompted to add to the recorded cases one that came under my care some months ago.

Mrs. E. F., age twenty-eight, of medium stature, but thin in flesh and deficient in physical strength. She had previously borne three children at full term, and had been the subject of several abortions. She was then advanced to about the seventh month. When I arrived at the house, she had been in labor about nine hours under the care of a midwife. The contractions were reported to have been quite strong and frequent for several hours. An examination being immediately made, I found the vagina filled with a large sac of water, distending it in every direction, the os fully dilated and quite soft and flaccid. I noticed that, as the contraction came on, there was but little strain put upon the membranes and there seemed to be no expulsive force exerted from above. A careful exploration failed to discover any presenting part of the fetus. I immediately ruptured the membranes and again made search for a presentation. I passed the hand into the uterus and was surprised to find it apparently empty and the walls quite soft and loose. Further exploration showed high up, nearly or quite on a level with the umbilicus of the mother, a small opening, and projecting through it a small portion of the placenta still firmly attached to the uterus. With considerable difficulty, and consuming much time, I succeeded in inserting the points of the fingers through the apparently cartilaginous ring, the hand closed in the form of a cone. By making counter-pressure with the other hand over the fundus I after some time succeeded in passing the stricture. I found the back of the fetus presenting over the opening with the head toward the mother's left. Passing my hand with great difficulty by the body and grasping the feet I brought them down and delivered without further delay.

After the membranes were ruptured, the contractions did not appear to be as strong as when I first saw the patient, but still my hand during each contraction, when it was within the upper section, was grasped so tightly as to render it almost impossible to move it in any direction. In my efforts to reach the feet my hand came in contact with the cord in which I could feel quite strong

pulsations, but it was almost pulseless when delivery was accomplished and the child only breathed feebly for a few minutes.

The placenta was delivered without delay, the uterus resumed its normal form, and the mother made a good recovery.

There was an unusually large amount of liquor amnii which was all discharged immediately upon the rupture of the membranes, there being scarcely any in the upper section of the uterus. The constricting band divided the uterus transversely into two nearly equal portions. The contractions were almost entirely confined to the upper section. The patient described the pain as being like a cramp and not like ordinary labor pains; and she felt no inclination to assist delivery by bearing down either before or after the discharge of the liquor amnii.

LIGATURES AROUND THE EXTREMITIES AS A MEANS OF HEMOSTASIS IN UTERINE AND OTHER HEMORRHAGES.

BY

J. W. PRYOR, JR., M.D.,
Lexington, Kentucky.

I WISH to call the attention of the profession to a method for arresting hemorrhage which, although not new, has been so little noticed in the literature of the subject that one would suppose it to have fallen into disrepute. I am at loss for an explanation for its seeming neglect unless it be for one of two reasons: either it has not been thoroughly investigated, and is not understood by the greater portion of the medical profession; or it is based upon false principles and justly deserves the disrespect of scientific men. To the former I am inclined to attribute the passing notice which it has received.

It was at the instance of my father, Dr. J. W. Pryor, Sr., of Pálmyra, Mo., that I first resorted to the use of ligatures, and his success led me to consider the virtue of their application, and apply them in appropriate cases.

Through the kindness of Drs. Pryor, Sr., Jandon, and Breckenridge, I append a few cases occurring in their practice in conjunction with each other and with myself.

The simplest method of hemostasis by ligatures around the extremities is comparatively of ancient origin, though its practical application, as far as I am able to glean from my reading

upon the subject of hemorrhages, is of limited experience. With the exception of a few instances, I am unable to find it mentioned in our works of acknowledged authority. Accepting the classification of Dr. Robert Barnes as a guide, in the selection of remedies as applied to uterine hemorrhage, we have the following degrees. 1st. The diastaltic function is maintained intact, giving a ready response to the customary exciters; 2d. The diastaltic function is markedly diminished, the excito-motor function responding but feebly to ordinary or extraordinary exciters; 3d. The diastaltic function is suspended. To the first degree are the ligatures eminently applicable, maintaining the diastaltic function intact, though its force may be somewhat diminished; to the second degree their use presents a different aspect, still of undoubted value. In this stage we will produce temporary blood stasis, verging upon the point of syncope, favoring the coagulation of blood in the ruptured uterine vessels.

Upon the following I base my reasons for the use of ligatures in uterine hemorrhage.

1st. We have four reservoirs, as it were, of blood retained for the prolongation of the patient's life, from which we can draw as the exigencies of the case demand; 2d. We relieve arterial pressure, reducing the force of heart impulse, thereby favoring the arrest of hemorrhage; 3d. By decreasing the amount of bleeding and checking the rapid flow of blood we gain time in which to employ the ordinary and extraordinary means for inducing contraction.

In applying the ligatures we may produce a symptom seemingly contrary to that desired, the patient may faint. This may be quickly obviated by lowering the head of the patient and raising the foot of the bed and loosening the ligatures. Fainting at this stage is, however, no disadvantage, on the contrary, it is to a certain extent to our advantage, as it is *per se* a means of arresting hemorrhage. It is not at all infrequent that we are called to attend women who have had hemorrhage following their previous confinements and who look forward to the close of gestation with fear and trembling, the predisposing causes of hemorrhage during pregnancy and parturition being intensified by the hemorrhagic diathesis. By gaining their entire confidence with the assurance that we possess a

means of prevention almost infallible, we gain an advantage of no little value as a means of prophylaxis. Take a case where you have reason to apprehend, or where hemorrhage has actually set in, apply a ligature or bandage (about an inch in width) around each extremity as close to the body as possible, drawing them sufficiently tight to arrest the return of venous blood without materially affecting the arterial circulation, then proceed with your other mechanical as well as medicinal agents. About the time the child's head is being expelled, give ergot and tincture cinnamon. Apply pressure over the abdomen by the hand while the child is being expelled, and continue the pressure until the placenta is delivered and uterus contracted.

The material I use is elastic web, one inch wide (taking a somewhat narrower ligature for the upper extremity) with a buckle similar to that found upon the common arctic overshoe. This simple contrivance occupies but a modicum of space in the accoucheur's case and should be carried constantly for the emergency. Unbleached cotton or any heavy material may be used, the requisite amount of pressure being obtained before the knot is secured.

Selecting from a number of cases I give the following :

CASE I.—Reported by Dr. J. W. Pryor, Sr.

Mrs. E., æt. thirty-five. Was called to see her in her seventh confinement. She had one living child, her first one. Five times she had miscarried between the fourth and fifth months. This time the fetus perished at the usual time, but was carried to full term. There was nothing unusual in her labor, the child being born in about three hours, placenta following shortly without an extraordinary loss of blood, the uterus contracting well.

The hemorrhagic diathesis being so marked in this patient, and she having nearly perished from loss of blood in each of her former confinements, I determined to remain in the house all night. About three hours after retiring, I was hastily summoned to find her in an extremely critical condition, her life in imminent danger. The hemorrhage commenced with a sudden gush, and continued profuse. Pressure on the uterus was made externally with the hand, so as to press the anterior wall upon the posterior, and the whole body of the uterus back upon the sacrum ; a small piece of ice was introduced into the vagina ; during this procedure ligatures were placed around the extremities by the nurse, restraining the hemorrhage so that time was gained for the action of restorative remedies. The stomach rejecting alcoholic stimulants, aromatic spirits ammonia, tincture cinnamon, and tincture capsicum were given, and a woollen cloth, saturated with ether,

was applied over the epigastrium. The ligatures and pressure arrested the hemorrhage and gave sufficient time for the therapeutic effects of the remedies used, thus arousing into action all the reserve forces of nature, and restoring the diastaltic function. Tonic muscular contraction of the uterus took place, and remained permanent, snatching the patient from the very verge of the grave. It is proper to add that this was the first time I had attended this woman. I am satisfied that, without the use of the ligatures, the patient would have died before the means for making uterine injection could have been obtained, not having them with me. I am also satisfied that, with timely and proper use of ligatures, the necessity will be obviated for resorting to more heroic and doubtful, and I may say, dangerous remedies, such as injections of iron.

CASE II.—Mrs. B., æt. 30. I was called to see this lady in her third confinement, and found her flooding profusely. On examination, I found a case of partial placenta previa. I applied the ligatures, and arrested the hemorrhage to a considerable extent. The os being dilatable, I separated the placenta on its detached side; found a head presentation; gave ergot and ruptured the membranes: turned the detached portion of the placenta back, allowing the head to descend and plug the os. The labor advanced rapidly. Just as the head was passing the vulva, I gave a second dose of ergot. After the birth of the child, the uterus contracted promptly and expelled the placenta. Notwithstanding the large amount of blood lost before the patient was seen, she made a rapid recovery.

In three other cases, one of repeated pulmonary hemorrhage and two of intractable epistaxis, the bleeding was speedily controlled by ligatures around the arms until the internal remedies had time to act in permanently arresting it. In the case of hemoptysis, several recurrences of the bleeding took place when, by way of experiment, the ligatures were omitted and internal remedies alone given, until the exhausted condition of the patient demanded prompt action. The ligatures were then applied, and the hemorrhage was immediately checked.

In supplying this remedy to epistaxis and hemoptysis, we surmount a difficulty hitherto unattainable, which could not be reached in any other way, *i. e.*, we relieve arterial pressure, allowing the patulous mouths of ruptured capillaries to become agglutinated and perform their hemostatic function. We hold the circulation in our hand, as it were, retarding or accelerating, regulating heart action.

In using this method of reducing heart impulse, we do not incur the disagreeable after-effects of heart depressants. Hav-



Dr Alfred H. McClintock.

American Journal of Obstetrics
and
Diseases of Women and Children.
July 1882.

ing the circulation at our command, we can, at a moment's notice, obviate the dangerous and fatal complications of anemia of the brain and diastaltic centre, cardinal sequences in profuse or continued hemorrhages.

OBITUARY.

ALFRED H. McCLINTOCK.

(With Portrait.)

ALFRED H. McCLINTOCK, the well-known and highly esteemed obstetric physician, died in Dublin on his sixtieth birthday (the 21st of October last), after a comparatively brief illness. His death has cast a gloom over the medical profession in this city, by whom he was not only held in the highest respect, but indeed beloved.

Although Dr. McClintock's death was almost sudden, it was not altogether unexpected by those who were on intimate terms with him, and who knew that he had for some time past exhibited well-marked symptoms of cardiac disease. During the summer of 1880, he was in a very weakly state of health, and, for him, in a rather desponding state of mind, and talked of retiring from midwifery practice; but having been induced to spend some time on board of his ship with his brother, Sir Leopold McClintock, who commanded the British fleet on the North American station, he returned with his health so much invigorated, that he relinquished the idea, and during the spring and summer of the present year, and indeed up to the very day of his fatal illness, continued in the active practice of his profession.

On the forenoon of the 23d of September, he drove to the house of a patient with the intention of visiting her, and got out

of the carriage at the door, but feeling unwell, stepped back into it, and drove home. The uncomfortable feeling he had experienced, however, passing off, he returned to his patient's house, and, while sitting beside her, complained of numbness in his right hand; then his speech became indistinct. He was with difficulty got into his carriage, and driven to his own house. Here he speedily became unconscious, lost the power of speaking altogether, and swallowed with great difficulty; his right arm and leg were also paralyzed. From this apparently hopeless condition he, however, rallied; he recovered his speech in a great degree, and was able to walk about the room. After an interval, he was removed a short distance out of town, but, in a few days, was attacked with hematuria. His breathing became difficult, and death soon terminated his sufferings.

Dr. McClintock's death coincided with the attainment of the highest honors which his profession could confer. He had only just vacated the chair as President of the Royal College of Surgeons in Ireland, while, in August last, he presided at the meeting of the International Medical Congress, in London, over the Obstetric Section, and his nomination to that post was acknowledged by all as being a well-deserved recognition of his professional eminence. He had also, early in the present year, been nominated by the Crown to a seat on the General Medical Council. No higher professional honors could have been conferred on him.

Dr. McClintock commenced his professional career as assistant physician to the Rotunda Hospital, under Dr. Charles Johnston, the then master of the hospital, for whom he always entertained feelings of great affection, and subsequently was elected master of the hospital at the unprecedentedly early age of thirty-four years.

During his term of office, he devoted himself with the greatest energy to the proper fulfilment of his responsible duties, and most efficiently he performed them. To his industry is mainly due the extensive museum of obstetric and gynecological preparations which exists within its walls. As a writer, Dr. McClintock attained a deserved high reputation. His most important work, his "*Clinical Memoirs on Diseases of Women*," was not, however, a success, if by that is to be understood its

obtaining an extensive circulation, for it never reached a second edition. This was not due to any want of intrinsic merit, for it abounds in important clinical observations, put forward in his usual clear and lucid style, but to the fact of its being in some points rather behind the times. Simpson was, at the date of its production, at his zenith, and McClintock's somewhat cautious practice did not in many points coincide with the teaching of that distinguished man, but McClintock's "Memoirs" will still repay any one who will carefully peruse them. His admirable Editorial Comments on "Smellie's Midwifery," a work undertaken at the instance of the New Sydenham Society, are of such recent date that they need no comment. He was also, conjointly with the late Dr. Hardy, the author of a work on Midwifery, which was virtually a report of the Rotunda Hospital during the mastership of Dr. Charles Johnston—a work which, as a book of reference, is of great value, but probably he was best known from his numerous monographs, which appeared from time to time in the *Dublin Journal of Medical Science* and other periodicals. His essay on "Secondary Hemorrhage after Parturition" (May, 1851) was an admirable one, and his account of the "Rise of the Dublin School of Midwifery" (Feb., 1858) most interesting. Among his more recent papers, one communicated to the Dublin Obstetrical Society, "On the Preventive Treatment of Post-Partum Hemorrhage," was specially valuable. His communications, however, to the various journals were too numerous to be recorded here.

As a speaker, McClintock was distinguished by the calmness and clearness of his utterance no less than by the lucidness of his style. He was a most agreeable speaker, and never hesitated or seemed at a loss for a moment. Nevertheless, he always felt diffidence in his own powers, and, on one occasion, when, after a very able speech, delivered at the meeting of the British Medical Association at Edinburgh, the writer complimented him on it, Dr. McClintock seemed surprised, and replied that he thought it must have been a failure, for that, on concluding, he felt, as indeed, he added, he always did after speaking, that he wished he had not risen, for that he seemed to himself to have left unsaid much of what he had intended to utter.

Dr. McClintock enjoyed a very extensive obstetric practice, but he avoided obstetric surgery; he also to the last continued to use the short forceps only.

Dr. McClintock's acquaintance with the literature of his profession was very extensive. He specially valued some of the older writers, such as Smellie, and to this predilection for these, as well as perhaps to a certain amount of constitutional timidity, and also the teachings of his old master, Dr. Charles Johnston, were probably due his somewhat conservative rules of practice.

Nothing showed McClintock's character in a truer light than the interest he ever evinced in the prosperity of the Medical Benevolent Society, to which for several years he acted as secretary. While most unostentatious, he was a most benevolent man, ever ready to join in any charitable work. He was, moreover, a Christian in the truest sense of the word, and of him it may truly be said, "mark the perfect man, and behold the upright, for the end of that man is peace." Death, long expected by him, had no terrors for him, and he died beloved by many, respected and esteemed by all.

LOMBE ATTHILL.

December 15th, 1881.

DEPARTMENT OF DISEASES OF CHILDREN.

EDITED BY GEORGE B. FOWLER, M.D.

ORIGINAL COMMUNICATIONS.

ORTHOPEDIC DEFORMITIES OF EARLY CHILDHOOD.

BY
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New York.

PAPER No. I.

UNDER this heading are comprised a class of cases which come mainly under the notice of the practitioner or family physician, and as the best results are to be obtained from early treatment the object of this series of papers is to place their management in a practical light.

1. *Infantile Talipes Varus*.—This condition presents certain characteristic appearances, the anterior portion of the foot being twisted upon the posterior, and the foot, as a whole, being twisted inward at the ankle, the articulation of the os calcis and the astragalus—the heel being elevated. See Fig. 1.

The first thought which comes to the mind of the observer is in regard to the advisability of an operation. It would seem as if tenotomizing the muscle would restore symmetry at once, without recourse to more gradual means. And the division of these tendons without delay is held by the great majority of surgeons to be the proper course indicated; for the immediate effects of such an operation are brilliant in the extreme and most satisfactory to the parents, the foot becoming easily restored to its normal relations with the limb and with itself, and it is then bound down to some splint, which affords support during union of the tendons.

The after-effects of this operation, however, are very disappointing in many instances, being succeeded by relapses into the original condition for which the operation was performed. And, while I am not one of those who condemn the practice in toto, I do contend that it should be only considered as a last resort, after everything else has failed.

We must bear in mind that most of these cases of congenital club-foot occur in children in whom there is deficient nutrition and development of muscle. By tenotomy a muscle becomes permanently weakened through the absorption of its structure after retraction has followed the division of the tendon and consequent separation of its divided extremities. And there exists a manifest impossibility for the muscle to entirely regain what it loses by such absorption. The question should then present itself to the mind of the physician: Is this limb in such an ex-



FIG. 1.

cessive state of muscular development that it can afford to part with a portion of its strength permanently? If you can satisfy yourself that such is the case, tenotomize; but an error of judgment in this regard is sure to bring down future anathemas if the operation be not permanently successful.

Some of the most marked cases of pedal deformity that have come under my observation have resulted from the abuse of tenotomy, or its employment when contra-indicated. It is, as a general thing, better for the patient and for the doctor to first exhaust every procedure which mechanical science can devise rather than resort to the knife; for, if injury be done through its use, it is almost irreparable.

It would seem, even to an unpractised mind, that it would be preferable to stretch the stronger and contracted muscles, and

thus relax the weaker, which are appropriately invigorated by treatment, until both become equalized in power, after which distortion becomes impossible. Before cutting the stronger muscles to reduce their strength to that of the weak, which are already too feeble to properly perform their functions, many prefer to try other means; and as the instructions laid down in the various text-books for the treatment of infantile club-foot are not sufficiently explicit to be of much use to the busy practitioner, it is principally my present object to supply this deficiency.

After thorough examination the foot should be taken in the hands, and gently *untwisted* as much as possible. This at first must be done cautiously, for the foot will be seen to turn white from interference with its circulation. I use the word "untwisted" advisedly, because a club foot is a twisted foot. Its curves are those formed by several twists combined, and any force used to reduce such a deformity must be employed carefully, and with this condition in view; not as if there were sharp angular bends which merely need the employment of a direct force to effect reduction.

At the same time that the foot is being *untwisted*, it should be *stretched*, the heel being drawn down. It will surprise those who have not thus handled a case to notice the readiness with which even very marked ones yield to successive manipulations by the hands, when they are educated to combine untwisting, stretching, and pressure together, or, in other words, untwisting, pulling, and pushing.

The pressure, or pushing, part of the process is exercised upon the protruding tarsus; but this must be done cautiously, and in conjunction with the untwisting and stretching, the latter tending to prevent the contiguous surfaces, which in children are more easily bruised than in adults, from injuriously pressing upon one another during the operation.

Our object is to place the foot in its normal relations, and, as this rarely is attainable or advisable at one sitting, we must employ some means of securing until the next attempt, such progress as may have been made. In young children this is best accomplished by the use of a strong twilled adhesive plaster and plaster bandage. A strip of such adhesive plaster about an inch in width is passed over the instep, down the inside of the foot, across the arch, and up the outside, and after being drawn upon,

is firmly fastened to the limb just below the knee, as in Fig. 2. A Y-shaped piece of the same material is then placed on the outside of the foot to approximate the heel and anterior portion of the foot, as in Fig. 3.

We will suppose that, as a result of the application of these plasters, the foot has been brought into and retained in as nearly the normal position as possible. A thin plaster of Paris bandage is now to be passed rapidly around the foot and leg, all possible stretching of the foot being practised during the setting of the plaster. See Fig. 4. The principle which governs the stretching of the foot during the setting of the plaster is the same as that which governs the stretching of the back during the application of the spinal jacket for curvature of the spine. Extension is rigidly secured; and in the foot the contiguous



FIG. 2.



FIG. 3.



FIG. 4.

surfaces, in the altered relations which they have just undergone during the untwisting, are thereby prevented from being pressed together too severely, as they otherwise would be, by the action of the now irritated muscles.

It may seem a complex procedure to practise this untwisting, but it is infinitely preferable to an unsuccessful tenotomy.

About a week should intervene between these attempts at untwisting the feet, to allow the subsidence of any slight irritation which may arise. The reduction of the protruding tarsus is the most difficult and delicate part of the procedure. The pushing is usually done with the thumbs, very gently, while an assistant stretches and untwists the anterior portion of the foot on the posterior.

To effect this reduction nicely, and without much pain, it is necessary, as said before, to practise stretching at the same time ;

for it is only as the rest of the foot approaches its normal relations that the tarsal bones are suffered to assume their proper positions.

Among other methods of retaining the infantile foot in a corrected position, may be mentioned the use of perforated felt. This is to be obtained either in sheet form or, what is more convenient, in pieces already moulded to the normal infantile foot (see Fig. 5), and the latter can be used in one of two ways.

It may be dipped in hot water, and then applied while soft, hardening in a few moments, the foot meanwhile being held in as nearly normal a position as possible. The splint is secured by a few turns of adhesive bandage. Or the foot may be placed directly in the splint, and fastened in it as firmly as pos-



FIG. 5.

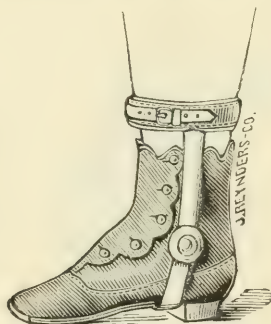


FIG. 6.

sible. But the latter plan is apt to cause discomfort, and is not so effective.

The principle which governs the use of the plaster-of-Paris or felt splints in *infantile* club foot is the resistance which the inherent stiffness of the material opposes to the tendency of the foot to resume its original position. At first, the foot is placed in as good position as possible, and held there rigidly until it has become adapted to its changed relations, when it is put in a little better position, and again held securely, and so on until with the forces applied the deformity has been obliterated.

By some the use of strips of adhesive plaster alone is advocated, but it is not a sufficiently firm dressing to prevent the foot twisting on itself, nor does it allow the *stretch* to be secured, which is important for the comfort of the patient.

When the foot has become so far reduced that it can readily be placed in nearly the normal position, one of the little shoes

that children wear may have a spring attached to its side (see Fig. 6) so as to oppose the tendency to twist inward, which, of course, the foot still retains if the plaster or felt be left off.

This spring is articulated opposite the ankle, and may be placed internally or externally, as the surgeon desires. In either case, however, the inclination at which it is attached to the shoe should be such, when the girth is buckled, as to turn the outside edge of the foot upward. See Figs. 7 and 8.

This simple device will be found very effective for the twisting inward of the foot, and if in addition a rubber strap be added, running from the side of the little shoe to the spring, inversion will be still more opposed; for the effect is to twist the anterior portion of the foot outward as well as upward.

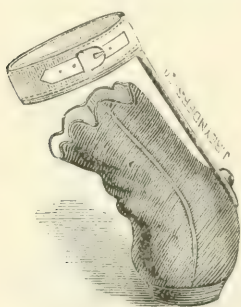


FIG. 7. Pushing Spring.

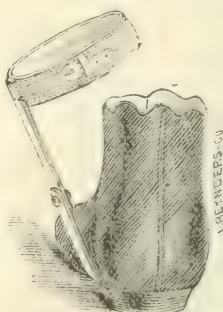


FIG. 8. Pulling Spring.

And as the little flexible soles follow the surface of the foot very closely, it acts as a very nice, light, and manageable club-foot shoe for infants, Fig. 9.

Another elastic cord may also be added from the girth to the shoe (Fig. 9), which will act against the contracted posterior muscles and tend to depress the heel as well as twist and hold the anterior portion of the foot upward.

But when these rubber cords are used, it becomes necessary to carry the side strip of the brace up to a point just below the knee, terminating there in another girth which is to be fixed immovably on the limb by a strip of adhesive plaster, the extremities of which button on the girth, as shown in Fig. 10. If this girth be not so fixed, the rubber cords will pull the side strip and girths around toward the toes and thus neutralize the effect. And besides, by turning the side strip, they convert the joint opposite the ankle into a lateral instead of an antero-

posterior joint, and thus take away even the lateral support of the spring strip. So that it must always be borne in mind, when elastic cords are used, to fix the girths on the leg immovably, just below the knee.

It is important in very young children to have nothing upon the foot which will annoy or give pain, and it is also important to avoid weight.

A shoe prepared in the manner I have described possesses these qualifications, and is in a marked degree applicable to these cases. And, as the mother is usually only too glad to provide a pair of the baby's shoes for such a purpose, any good

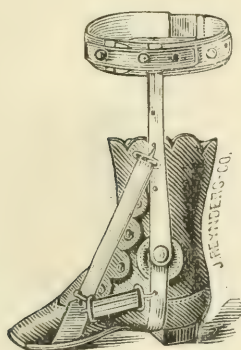


FIG. 9.

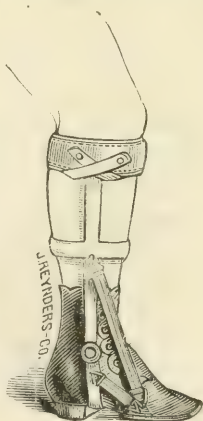


FIG. 10.

instrument maker can easily add the attachments. Without the spring at the side, however, in these cases, I do not consider the addition of rubber cords of much advantage.¹ Even though by these procedures we have apparently produced a relief of the condition, yet it cannot be considered cured until the child has begun to walk, or at least to stand; and this introduces a new factor into the case which is of the utmost importance, *i. e.*, weight.

The weight of the child is the most important agent in effect-

¹ For older children, the side spring strip, instead of being rigidly attached to the shoe, should be connected to it by means of a pivot below the foot in the centre of motion. This allows the elastic power to be used to greater advantage without impeding the normal motions of the foot. It also avoids the necessity for a transverse division of the sole opposite the mediotarsal articulation, with its obvious disadvantages to comfort and cleanliness.

ing a cure of the condition under consideration that we have, if rightly employed.

It needs but a moment's reflection to understand how the constant reception of twenty-five or thirty pounds upon a mal-placed foot would increase the deformity, and, on the same principle, if the foot can be so placed as to receive this weight in nearly its normal position, the constant application of the force would tend to press out the deformities. To utilize the weight of the body as a curative factor in the treatment of infantile club-foot it is necessary for us to use spring power;¹ and this spring power may be either pulling or pushing in character, and formed of thin metal, or rubber, or allied elastic material.

It must be plainly understood, however, in the treatment of these cases, that the weight of the body should not be borne upon the foot until its axis be at its normal angle with the leg when the patient stands.

In the majority of cases the combination of elastic straps and the metallic spring, already described, will be sufficient to keep the *infantile* foot in position to receive the weight of the body, and will assist such weight to complete the cure.

If any of the club-foot shoes, which are provided with split soles and uprights on both sides of the ankle, be used for such young children, their weight and general unwieldiness imposes an impediment to the proper movements of the feet, and are apt to do more harm than good unless employed by those specially expert in their use; and for that reason, perhaps, severe cases, if not tenotomized, are often allowed to go on uninterruptedly until advanced childhood before relief is sought.

¹ Sayre (Diseases of Joints) recommends the use of Barwell's apparatus, but the application is complex and embodies a dangerous principle in orthopedics: that of covering muscles which are in use. To apply and hold the tin plates which act as the staples for the insertion of the elastic cords, it is necessary to encircle the calf with plasters which tend to obstruct the free play of the muscles beneath, and their nutrition, too, is thereby impaired.

It may perhaps be argued that the fixation of the foot and limb in plaster-of-Paris or felt, during the preliminary reduction of the deformity, is open to the same objections, but the fact, that this encasement is used before the weight is borne upon the limb is sufficient to controvert this. I see no particular objection to Barwell's apparatus beyond its cumbersome and the tendency of the plasters to slip if used before the weight of the body is borne upon the foot; but after walking is begun I am not in favor of its use, for the reasons above-stated.

Almost all cases of congenital club-foot should receive the benefit of spring power at the time that walking commences; and if they do not receive this, no matter how well the foot may have been manipulated up to this time, relapse is almost sure to occur. This is, indeed, the critical time for treatment of club-foot, and I cannot impress it too strongly upon my readers; for if the foot be now so placed and held that the weight is received normally, every step and every jump of the child tends to cure the malposition permanently; while if such be not the case, if the foot be turned inward in the least beyond the normal angle,

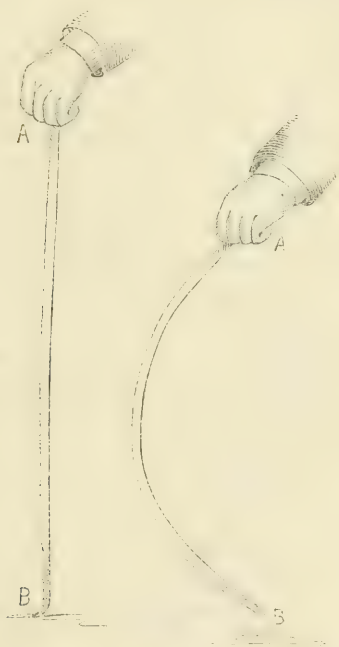


FIG. 11.

every step and jump will serve to increase the deformity, and render it more difficult ever to overcome.

A condition often found associated with talipes varus in young children is that of *GENU-VARUM* OR *Bow-LEGS*.

This is another of the deformities of early childhood requiring prompt treatment. It is so common a condition, and brought so prominently to the notice of every practitioner, that an extended description of the deformity would be out of place here. It

will, therefore, be sufficient for our purpose to notice, as its prominent feature, that the weight of the body is borne by the limbs, not perpendicularly, but, as its name implies, in a bowed line; the knee being outside the perpendicular passed from the hip to the ankle. If a bow be placed upright, as in Fig. 11, considerable downward pressure would be required to produce a curve while the straight line is preserved; but when this has yielded, the vertical distance A B becomes less in proportion as the curve increases, and the greater the curve the less downward pressure is required for its increase. If the human

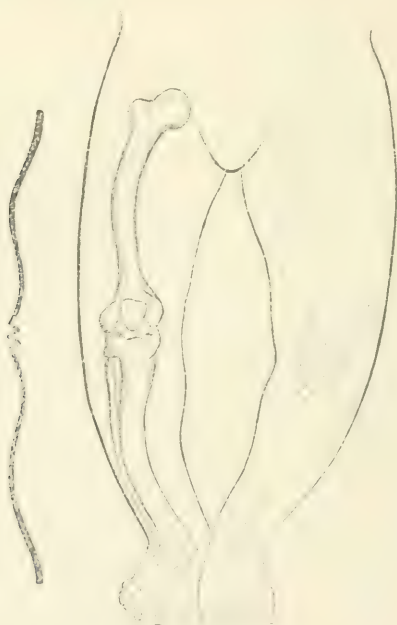


FIG. 12.

frame be erect the leg may be compared to such a bow with a weight placed at its upper end. So long as the bow is of sufficiently stiff material to sustain the weight curving does not take place; but if it is weak and yielding, gravity draws the weight at A toward the earth at B, and in doing so, curves the bow in the direction of the least resistance. So it is with the human leg. The weight of the body is best borne upon an upright limb; but if, through impaired nutrition or develop-

ment, the bones are not of sufficient inherent strength to offer this erect resistance, a curved condition results.

The direction of this curve is lateral and outward, and is often associated with secondary curves. Were the arc of resistance equal at all points the centre of the bow would be opposite the knee-joint. But the structure of the joint is such as to cause the limb to form, instead, a double curve, the upper part of the femur being perceptibly convex outward, and the lower part convex inward; the tibia above being convex inward, and below convex outward. By a glance at the appended diagram it will be seen that the bones of the limb are, by these curves, given the appearance of a double bow, the knee joint itself not being bent to any great extent. Fig. 12.

The rarity with which the epiphyseal relations are interfered with in this condition is noticeable, and is, perhaps, explainable upon the hypothesis that the hinge-like formation of the knee is so perfect, and the lateral ligamentous supports so complete, that the weight of the body is not sufficient to displace it outwardly; and, consequently, the femur above and the tibia below give way near the centres of their shafts, thus forming double curves very much resembling in their shape the bow depicted in the figure.

It is important to locate the centre of curvature in the tibia and femur, since it is at those points that the force must be exerted which is to press the limb back to the perpendicular line.

This, in young children, is accomplished through the medium of spring power—such as I have already detailed when treating of talipes varus.

It is important, with children, to avoid cumbersome apparatus of any kind, fixed force being particularly disagreeable and even injurious to their yielding frame.

Now, spring power may be utilized easily and perfectly for the cure of bowed legs in the following manner, and the apparatus will be found free from the defects of weight, rigidity and difficulty of wearing. Four girths are provided, made of thin steel (Fig. 13), whose extremities ride into one another, so as to admit of variation of their circumferences, and yet preserve a stiff, circular form, which will not draw upon the soft parts so as to interfere with the circulation or cause discomfort. This they are more apt to do if formed simply of leather, or padded in the usual manner.

These girths are to be placed on the limb at the centres of the curves already described, and are connected by a thin strip of steel which runs down the outside of the limb, is articulated opposite the knee, and sprung into the form of a double bow, as shown in Fig. 13. It will be seen that this strip of steel corresponds in shape to the bow which is formed by the bones of the leg. But when applied these curves are placed reversely to the curves of the leg, centre against centre (Fig. 14).

This contrivance does not interfere with the motions of the limb, and exerts a constant spring force directly against the curvature, the power varying with the age of the child.

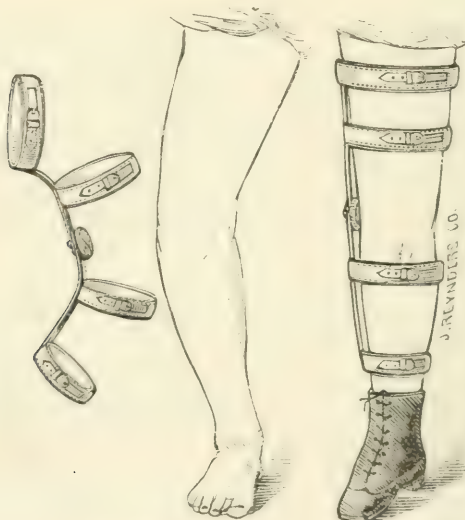


FIG. 13.

FIG. 14.

It is a very light, easily-adjusted brace, and seems to meet every indication.

It may be used also as a night splint, and, when in constant use, should be removed at least once a day to permit the muscles to be rubbed and manipulated.

There is one point relating to this condition of bowed legs which, it seems to me, has received too little attention from writers upon this subject, and that is, the malposition of the feet. Many of the cases which present themselves for treatment carry the weight of the body upon feet which are inverted, and almost in the state of talipes varus, and this seems to be

proportionate in many cases to the degree of curvature of the legs. It would seem as though the malposition of the foot might be attributed to insufficiency of the peronei muscles, due to an increased stretch upon them as the curve of the bone increases, followed by a secondary relaxation of the external ligaments of the ankle. An examination of the normal ankle-joint leads to the conclusion that its external ligamentous supports are so placed that, were it not for the supporting action of the tendons of the peronei, the ankle would be so relaxed as to be incapable of sustaining itself in its correct position. The peronei seem to be endowed not only with the power of everting the feet, but also of preventing them from turning under,

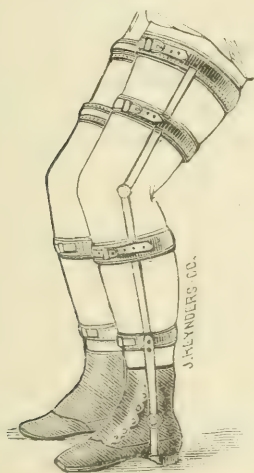


FIG. 15.

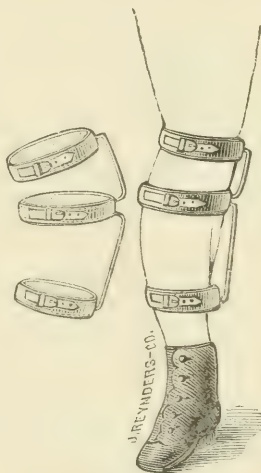


FIG. 16.

and of preserving the balance of muscular force which retains the foot at its normal angle with the leg. The external ligaments of the ankle, unassisted by the muscles, are not capable of retaining the foot at this angle, while on the inner side of the ankle the ligamentous structure is sufficient, of itself, to effect this.

The inverted feet accompanying bow-legs are, then, I believe, partially due to relaxation of the peronei; for in many cases of bow-legs where the muscular system is of sufficient development, and the peronei are of normal power, the foot is everted normally.

There is, however, a tendency in some cases to walk too much

on the inner edge of the sole—a fault we can, with some degree of certainty, ascribe to the reception of the weight of the body by the foot somewhat inside of its usual axis, and a consequent forced stretching of the internal ligaments. Talipes valgus is, therefore, occasionally associated with bow-legs, but not so often as varus. Perhaps the neglect of the proper appreciation of the importance of restoring the malplaced feet has had an important bearing upon the unsatisfactory results so often obtained in the treatment of severe cases of bow-legs.

To correct the malposition of the feet we add the lateral foot spring, already described under talipes varus, to the remainder of the bow-leg brace, as in Fig. 15, having the spring at the shoe so inclined as to throw the foot outward if it turn inward, and *vice versa*. If the curvature be found to affect the bones of the leg alone, or the thigh alone, as is sometimes the case, the spring power should be applied only to the part curved, the brace not being required to extend above or below the points of actual curvature, as in Fig. 16, in which the curvature being confined to that part of the limb below the knee, the spring power is placed on the inside.

OPHTHALMIA NEONATORUM.

BY

THOMAS T. GAUNT, M.D.,

Resident Physician to the New York Lying-in Asylum; Late House Physician at the Maternity Hospital, Blackwell's Island; Late House Physician at the Charity Hospital.

It appears to me that some of the points upon this subject, which were rather dogmatically treated by Dr. Lyman Ware in the April number of this JOURNAL, will bear a closer scrutiny and further investigation. Those having the management of young infants in obstetric hospitals find this disease second to none in importance. Its proper care has therefore always been a matter of great interest to me.

Dr. Ware excludes completely any cause for ophthalmia neonatorum other than direct inoculation. Now, it is extremely probable that the majority of cases are caused in this way; namely, by the reception of leucorrhœal or, in exceptional cases, of gonorrhœal matter between the lids, occurring during the

child's passage through the parturient canal. The theory of local inoculation, however, takes no account of those cases which every careful observer has seen, in which there is no evidence of inflammation for weeks after the birth of the child.¹ As the first signs of the disease, when caused by local inoculation show themselves in from three to five days, or, according to Wells, from twelve to seventy hours, it is evident that some other influence must be present in those cases in which the inflammation occurs after the first week.

It is customary to explain away this fact by saying that a sufficiently careful examination would have revealed a commencing inflammation. So careful a man as Wells is surely capable of detecting slight inflammatory changes. I speak with considerable confidence on this subject, for I have many times inspected a child's eyes daily, and found nothing abnormal until as late as the seventh, tenth, or even fourteenth day, when a purulent ophthalmia would be lighted up, which was indistinguishable from that commencing on the third or fourth day after birth.

It is true that a certain number of these cases might be caused by a manual transfer of infecting material, by an uncleanly or careless mother or nurse. There are many cases of ophthalmia with a late invasion, however, which I have seen, where neither the mother nor nurse were uncleanly, careless, or lacking in intelligence, and who, being cautioned against this danger, were very painstaking in avoiding it. With these facts of experience I have been forced to recognize some cause extrinsic to the local inoculation on which Dr. Ware so implicitly relies.

The majority of authors I have been able to consult² admit that local irritants, such as cold, foreign bodies, and chemical substances, sometimes stand in a causative relation to this disease.

¹ Treatise on the Diseases of the Eye. J. Solburg Wells. Edited by Bull, p. 74, 1880.

² Stewart: Practical Treatise on the Diseases of Children, p. 534. 1841. Bedford: Principles and Practice of Obstetrics, p. 424. 1861.

Tanner: Practical Treatise on the Diseases of Infancy and Childhood, p. 164. 1858.

Evanson and Mansell: Diseases of Children, p. 115. 1838.

Bryant: Manual for the Practice of Surgery, p. 246. 1881.

J. Lewis Smith: Diseases of Infants and Children, p. 77. 1881.

Wells, loc. cit., p. 74.

It has been usual also to ascribe to some unknown telluric influence the power of setting up ophthalmia neonatorum. Prof. Gross thinks this the usual cause, thus he says, "My conviction is that the disease, as it usually appears, is of atmospheric origin, depending upon the same causes as the purulent ophthalmia of adults, and is therefore, wholly free from specific poison."¹

This form is often seen during epidemics of septicemia in lying-in hospitals where there occur simultaneous epidemics of ophthalmia neonatorum. J. Lewis Smith,² Trousseau,³ and Bouchut⁴ have all referred to this. I have known of two extensive epidemics thus occurring in a hospital where septicemia was prevailing at the time. Overcrowding and bad hygiene seem at times to produce the disease in an epidemic form.

The facts point unmistakably to causes other than local inoculation, as being sometimes capable of producing this disease.

It would appear then that the following comprehends all the known causes of ophthalmia neonatorum:—(1) Local inoculation, in which it is needful to have brought to bear a sufficient amount of an active poisonous substance.⁵

(2) Local irritants, exclusive of such poison.

(3) Unknown epidemic influences and, possibly, bad hygiene.

For convenience we will consider the pathology and symptomatology of the disease at the same time. I believe that the treatment of ophthalmia neonatorum should be governed entirely by the stage of the disease to which the pathological changes have led. It is therefore of paramount importance to have a full pathological picture of this affection, and I make this my apology for presenting so detailed an account.

We will take, as most typical, a case dependent upon local inoculation. Usually, before the third day, and sometimes even at birth, the eyelids are a little reddened, slightly swollen, and there is increased lachrymation. The first pronounced change

¹ Gross: System of Surgery, p. 245. 1872.

² Ibid., p. 77.

³ Gazette Médicale de Paris, p. 54. Jan. 24th, 1852.

⁴ Practical Treatise on the Diseases of Children. M. Bouchut, Bird, p. 665. 1855.

⁵ This quantitative and qualitative relationship would seem a reasonable explanation of why so many infants exposed to the poison escape. Dr. Ware offers the following to account for this frequent immunity: "The instinct of the infant is superior to the knowledge of the mother, and curls its eyelids inwards, and thus avoids the poison."—AM. JOURN. OBSTET., p. 466, April, 1882.

noticed is the appearance of a bright-red transverse line, occupying the middle of the palpebral conjunctiva. Shortly after this the edges and internal angle of the lids become red and painful on pressure. The ocular conjunctiva is the next in order to become involved, it appears bright-red and villous. The swelling of the lids increases, the lachrymal caruncle and semilunar fold become swollen. The discharge, which was at first purely lachrymal, now becomes serous, and gradually assumes a resemblance to turbid whey. There is considerable photophobia, the child closes its lids so tightly that some force is required to separate them, which being done the eye is rolled upward. On removal to a darkened apartment the eyes are voluntarily opened. The progress of the inflammation to this point closes what I have chosen to call the first stage of ophthalmia neonatorum.

The second stage, or that of suppuration, is ushered in usually by marked increase in the swelling of the lids. This swelling increases so rapidly, that often in from twelve to twenty-four hours they cannot be separated except by the employment of considerable force. The child cannot now open its eyes at all, the upper lid usually overlaps the lower, and is often so stiff that it is very difficult, and in the worst cases impossible, to turn it. The amount of swelling would appear to be more dependent upon individual laxity of the tissues than upon the severity of the local inflammatory process.

On separating the lids the vessels of the exposed conjunctiva will be seen to be greatly dilated, the *annulus conjunctivæ* may sometimes be distinctly outlined, but it is more usual to observe a generally diffused bright-red hue, through which the sclera can be dimly seen. The papillæ are prominent. At first there is a muco-purulent coating over the entire mucous surface. The discharge soon becomes more abundant and decidedly purulent, and is later thick and creamy. If the child be jaundiced, the discharge is stained a deep golden hue. The effusion under the conjunctiva usually contains so little fibrin, in the less severe cases, that it remains unrecognized. In some epidemics, however, and in many cases set up by the reception of gonorrheal matter from the vagina, the amount of fibrin may cause so firm a coagulum that the raised surface of the conjunctiva is quite firm and resisting. These latter are of necessity very grave cases, and in many of them sloughing ulcers of the

cornea result, in consequence of the compression of the conjunctival and episcleral vessels. The mechanical results of this effusion are chemosis and swelling of the lids. This swelling of the opposed mucous surfaces is an important factor in producing strangulation of the vessels which furnish the cornea with nourishment. When the effusion is very great, however, or the subconjunctival tissue lax, the swelling of the ocular portion may cause it to extrude between the lids, while that of the palpebral lining may force the tarsi outward, frequently producing ectropion.

The orbicularis palpebrarum is often thrown into violent spasm, especially noticed after ectropion has taken place, and by the almost continuous exertion of its sphincteric action, may be the principal factor in causing corneal ulceration, by strangulating the conjunctival vessels as the result of the great and nearly continuous pressure on the surface of the eyeball.

As the inflammation progresses the secretion becomes enormous, considering the small area of secreting surface. In some bad cases I have seen produced, as near as could be estimated, fully an ounce of purulent fluid from each eye in twenty-four hours. The free edges of the lids are sealed together by the drying of the discharges as they flow over them. On separating the lids the pus gushes out with some force. The pressure in this way exerted is a consideration of some importance. The cornea lies macerating in the pus thus imprisoned, as in a purulent bath. The cutaneous surface of the lids is livid and traversed by veins enlarged from passive congestion.

Early in the second stage it is usual to notice unmistakable evidences of pain on the part of the child. When the case is severe there is often a marked febrile movement, the child becomes restless, very irritable, and refuses the breast. The combined influence of an exhausting discharge, pain, loss of sleep, and the depressing effect on the nervous system is soon obvious. When the local inflammation is slight the child usually thrives as well as before its onset. In the majority of cases of ophthalmia neonatorum there is no further advance of the disease. The inflammation having reached its height begins to subside, and usually results in a complete recovery without sequelæ. If untreated, the eye is well in from four to six weeks. Some cases pass into a chronic catarrhal inflammation. In others the papillæ remain permanently enlarged, pro-

ducing trachoma; or there may be left minute cicatrices similar to those resulting from granular lids. The lids may continue relaxed after recovery, or, resulting from an increase of connective tissue, have a leathery firmness; or, finally, present slight submucous bands, similar in causation and structure to urethral stricture.

Passing from this somewhat detailed picture of the second stage, we come to the third, or stage of corneal involvement. This complication, which is in one sense a sequel of ophthalmia neonatorum, is sometimes seen in the badly-treated or neglected cases, but is more frequently met with during an epidemic of the disease.

The cornea may have from one to all of its concentric laminae involved, and suffer, in area, from a mere point to its entire surface. There will be, therefore, a corresponding variation in the severity of different cases. For convenience, however, we may consider the changes under two heads: (1) Those in which purulent infiltration occurs, without gross loss of substance. (2) Those in which there is an appreciable solution of continuity. This last class naturally subdivides itself into: (a) Ulcerations so superficial that the contents of the eye are not evacuated. (b) Ulcerations leading to perforation of the cornea, with the escape of aqueous humor, etc. The first class of cases, *i. e.*, where there is infiltration, is usually dependent upon a corneal inflammation resulting from its contact with the purulent secretion. The second class may be but a later stage of the first but is perhaps more often the result of strangulation of the vessels which form the *annulus conjunctivæ*—formed by loops of the anterior ciliary arteries. As the pathological and clinical pictures are different in both these cases, they will be considered separately.

Purulent infiltration usually occurs from eight to ten days after the disease has been well established. The pus insinuates itself between the corneal laminae, and the usual brilliancy of the cornea becomes dimmed. This change is due, in part, to an alteration in refractive power, and in part also, to loss of the superficial epithelium through maceration or inflammation. If the corneal changes are arrested here, as they not infrequently are, we get rapid recovery without any appreciable structural alteration, or with but a slight nebulous change. If the infiltration have been greater, a part of the cornea may, on recovery, resemble a bit of ground glass, while a few vessels are sometimes

to be seen deep in the corneal tissue. The smaller leucomæ usually disappear, owing to the activity of the absorbents in young children, and even those of considerable size may clear up. It often, however, takes months for its completion, or even longer. For the cornea to again become perfectly transparent the infiltration must have been superficial. If the effused pus be considerable, or the inflammation of a low type, either because of unfavorable local or constitutional conditions, the diseased process may pass on to ulceration, the second class of corneal changes. The loss of tissue is effected in the following manner: Alterations are most often first observed in the centre of the cornea, obviously, it seems to me, because this is the part of lowest vitality, being farthest removed from the nutrient supply. These changes consist in the appearance of one, but usually more spots, having a grayish tint. These are points of corneal softening, and may give rise to an ulceration of sufficient depth to terminate in perforation, which, at times, ends only with the loss of the eye.

All corneal ulcers, however, do not go through a preliminary purulent infiltration. Necrobiosis may result from strangulation of the episcleral and ocular conjunctival vessels in these three ways: 1st. Extensive *edema conjunctivæ*, which may be rendered more pronounced by the exudation being fibrinous. 2d. Spasm of the orbicularis palpebrarum. 3d. Pressure from imprisoned discharges. There is often also increased intra-ocular pressure, and especially augmentation of the aqueous humor. The action of these opposed forces may be so great as to shut off nearly all the nourishment from the cornea. This may occur in bad cases as early as the second or third day; the cornea first becoming dull, like that of a dead fish, may slough off, leaving only the edge undestroyed. Through so large an opening, the aqueous humor, crystalline lens, and even the vitreous, often escape, resulting in the total destruction of the eye. In the milder degrees of strangulation there may be one or more rapidly-spreading central or marginal ulcers. They appear as though a piece of cornea had been stamped out with a punch, the edges being clean cut, the surface shiny and opaque, the excavation more or less deep. The less severe corneal ulcers are small and transparent, and unless viewed obliquely, may be overlooked. The latter usually heal readily. The cornea is marked by numerous minute vascular points, where small blood-

vessels have developed. Keratitis is often quite painful, but, in some cases pain seems to be absent. Should the centre of the ulcer extend to a sufficient depth it will result in corneal perforation. If this opening into the anterior chamber be small, there will be a partial or complete evacuation of the aqueous humor, the iris may be floated forward, and becoming adherent at the perforation, an anterior synechia results. If a larger opening occur, the iris may protrude as a brownish nodule.

These smaller ulcers usually heal, their edges first becoming rounded, while their surfaces get roughened and more opaque. The cicatrix thus left results in an intractable leucoma. At times a still larger loss of substance occurs, the iris in this case bulging forward, covered by an inflammatory glazing; while, in some cases, the *membrana Decemetii*, or the posterior elastic lamina of the cornea, seems to resist destruction, and is present as a thin coating for the protruding iris. These cases often terminate in staphyloma, the membrane, becoming thicker, remains partially opaque, while later a network of vessels shoots over its surface. A choroido-iritis may ensue, followed by shrinkage of the globe.

When ulceration results, the bright rosy tint remarked while the inflammation was at its height, gives place to a dull livid color. The discharge also changes, becoming more thick, greenish in color, and is often stained with blood. The swelling of the lids subsides, and they are left relaxed and flabby.

We may briefly recapitulate the changes which mark the invasion and progress of this disease, as follows: 1st. Stage of active congestion and passive effusion. 2d. Stage of active purulent secretion. 3d. Stage of corneal involvement, which we have considered rather as one of the sequelæ. I would especially impress the utility of this division, believing it to be of great service in clinical study and therapeutic guidance.

As a rule both eyes are affected, either simultaneously, or in rapid succession. At other times, one eye only is involved, the other remaining perfectly free. During an epidemic at the Prague Foundling Hospital, occurring in 1844-5, in only seven cases out of three hundred was it confined to one eye.¹ The ordinary cases, occurring independent of epidemics, have the

¹ Dr. Mulder's *Essay d'Oculistique*, sér. 4, tom. ii., p. 140. Quoted by M. Bouchut, *Treatise on the Diseases of Children*, etc. Translated by Bird. London: 1855.

inflammation confined to a single eye. The inflammation is in some cases catarrhal in one eye and purulent in the other. The disease is liable to recur so long as the lids remain relaxed and flabby. It is well to bear this in mind, so that the first symptoms of a return may be combated.

I have said nothing of catarrhal ophthalmia, for the symptoms are mild, and there is practically no danger to the cornea from the disease.

Prophylaxis of ophthalmia neonatorum has of late received considerable deserved attention. If, however, we examine the physical conditions under which the vaginal discharges find their way beneath the child's lids, and contrast with that the imperfect cleansing accomplished by the most careful washing of the eye in the usual manner, our faith in the efficacy of the routine preventive measures cannot but receive a shock. Consider for instance, how quickly a smooth foreign body, as large even as the so-called "eye-stone," will find its way to the cul-de-sac formed by the junction of the ocular and palpebral conjunctiva: contrast with this the unctuous leucorrhœal discharge, and then fancy the ease and rapidity with which it is able to insinuate itself into the same cul-de-sac.

And, now, as to the efficacy of the washing, picture how little this cul-de-sac is encroached upon by everting the lids and douching the eye as generally recommended. It is claimed, however, that disinfectants should be used, and that thus the poison may be annulled. Candidly, what good can be done in this line, with a fraction of a drop of a four-per-cent solution of boracic acid, or weak solutions of carbolic or salicylic acids, or any other antiseptic, which it is safe to apply to the delicate and sensitive conjunctiva? Unaccountably favorable results are claimed for each of these antiseptics, which I have tried in vain to achieve. I have washed out the vagina with antiseptic and cleansing injections; I have turned and cleansed the child's eyes before tying the cord, but have never ventured, however, to wash the eyes before the shoulders were born, as is recommended by certain German enthusiasts. I think I have employed every reasonable precaution, but have noticed no falling off in the number, or lessening in the severity of the cases of ophthalmia neonatorum. I have, further, gathered statistics from three of my obstetric friends who became at one time converts to the theory of absolute pre-

vention, and all of them, after giving it a fair trial, are unanimous as to its practical inutility. By the mechanical means presently to be described for thoroughly exposing every point of both the ocular and palpebral conjunctivæ, it may be possible to secure an infallible prophylaxis. It would be desirable to use such means, only in those cases where a very profuse or virulent vaginal discharge rendered inoculation probable.

And, finally, as to the treatment, for making which intelligible this detailed description was prepared, I have some suggestions which I think are novel, and which I trust may not be devoid of interest.

A cardinal point in the successful treatment of ophthalmia neonatorum is the early detection of the commencing inflammation. It is so insidious in its onset that the medical attendant should inspect the eyes daily himself, and if even no more marked phenomenon than increased lachrymation is noticed, he should be the more alert in watching for further manifestations. The examination is conveniently conducted by wrapping the child in a shawl to pinion its arms, laying it on the nurse's lap, while the operator sits opposite, and receives the child's head between the knees. In making the examination, great caution should invariably be used, first, lest by incautious handling a commencing inflammation be excited to greater activity; second, to prevent the purulent fluid, often imprisoned by the sealed lids, from being thrown into the operator's own eyes; lastly, and most important, is the danger of rupture by indelicate handling of a cornea already softened or deeply ulcerated, and over-distended by an excessive amount of aqueous humor. Bearing in mind these dangers, the lid is to be separated in the following way: "The surgeon now moistens the edges of the lids with a rag dipped in warm water, in order to facilitate their separation, and proceeds with his examination. In his attempt to open the eye he is careful not to make pressure upon the globe, in order to avoid giving unnecessary pain. . . . With one finger placed just below the eye, he slides the integument downwards over the malar bone, and thus everts the lower lid, the upper lid being elevated by a similar manœuvre, with the other finger of the same hand applied below the edge of the orbit. All this may be accomplished with the left hand, the right being free to wipe away the discharge or to make applications to the eye."¹

¹ Venereal Diseases, p. 217. Bumstead & Taylor. Philadelphia, 1879.

When there is an excessive discharge obstructing the view, or when even the slight amount of pressure brought to bear in separating the lids by the fingers is undesirable, the procedure to be spoken of directly should always be employed. During what I have designated the first stage some of the most brilliant results in modern therapeutics may be obtained if a rational treatment be used. As soon, then, as the swelling of the lids and the characteristic red transverse line, which has already been spoken of as traversing the palpebral conjunctiva, be present, abortive treatment should be instituted. The earliest measure should consist of the constant free use of a collyrium containing two grains of the chloride of zinc to the pint of water. This may be used half-hourly at first. The eyes are to be covered by bits of sheet-lint, one inch square, that have been soaked in a solution of alum, eight grains to the ounce of water. These are to be left on for fifteen minutes every hour during the day, and discontinued at night when the child is left to sleep undisturbed. If this treatment have been begun in the first stage of ophthalmia neonatorum, a large majority of the cases may be aborted. The swelling rapidly disappears under the applications of alum, while the weak zinc solution seem to act as a specific. Those who have never witnessed the efficacy of a similar treatment in cutting short a commencing gonorrhea,¹ will be considerably surprised at the great power it exercises in the analogous condition, purulent ophthalmia, when used during the first stage. So far as I know, this is the first time that the abortive treatment of ophthalmia neonatorum by mild applications has been recommended. The stronger solutions of silver, gr. xx. to xl. to the ounce of water, or any other powerful topical applicant, is of questionable utility and, before the discharge is free, may do damage. If in spite of these mild measures the disease do not improve, it will probably run into the second or purulent stage. When pus is first noticed in the secretions, the following simple expedient is to be employed for thoroughly exploring and cleansing every point of the conjunctiva.

Procuring two small-sized hair-pins, form each one into a hook, by bending them at about one-fourth of an inch from the arch, so that an angle of somewhat less than 45° is formed. While inserting, and on separating them, so as to expose the cornea, great gentleness must be used, while the direc-

¹ Handbook of Therapeutics, p. 25. Ringer, 1879.

tion of the force should always be away from the globe of the eye. It is obvious that much damage can be done by this contrivance if used in an awkward manner and without due consideration of the pathological conditions present. Pressure on the eye is always dangerous in ophthalmia neonatorum, whether it be made by the finger, the curved lid retractor, figured by Dr. Ware, or, worst of all, the spring speculum. I think, however, that by the judicious use of the hair-pin retractors, all injurious pressure on the eyeball or cornea may be avoided. When there is a suspicion of corneal trouble it is best to insert the retractors near the outer canthus, and, then partially raising the lid away from the globe, slide them along until in front of the cornea, where, upon separating the lids, a perfect corneal exposure will result. Besides this perfect view granted of the cornea, an equally important exposure of practically every point of the conjunctiva, both ocular and palpebral, may be effected. This allows of a more thorough inspection and perfect cleansing than has ever, I think, been previously possible. When we consider for a moment that the lids are held in close apposition with the globe of the eye largely by atmospheric pressure, aided to some extent by the *musculus orbicularis*, it is evident that but slight force is needed to uphold the lid, after air has been admitted beneath it. This, I think, explains the value of the hair-pin retractors. The amount of foreign material making up the arch is so slight, and the surfaces so smooth and uniform, that the eye tolerates them with considerable comfort. While I have seen the ordinary appliances abandoned because of the child's resistance, I have never met with any difficulty since using these retractors in exposing the cornea, as well as the entire surface of the conjunctiva, for examination and medication. Being thus able to see, cleanse, and medicate every point of the conjunctiva, with ease to the operator, and but slight annoyance to the child, is an advantage which this contrivance—I am hardly so ambitious as to call it an instrument—possesses, and I trust will recommend it for trial. There are the following additional practical points, in respect to the hair-pins, which it may be well to mention. They can be easily altered in shape, and so may be adapted to suit the fancy of the operator, or exigencies of the case. After using I invariably destroy them, thus avoiding all risk of conveying the disease—a point of no mean significance it seems to me. The hair-pins are always at hand,

and are especially convenient in emergencies. Finally, this retractor presents nothing to frighten either the friends or the child.

Its use for procuring a perfect exposure, and applying disinfectants for prophylaxis, has been spoken of under the appropriate heading. When pus is first noticed, then, in the discharge, after inserting the retractors and examining the conjunctiva, cleanse the mucous membrane thoroughly with a solution of borax, gr. x., to the $\frac{3}{4}$ i. of rose-water. It may be needful to use a bit of sheet-lint to absorb or wipe away the tenacious secretion. If the amount of discharge increase, a solution of from one-fourth to one-half a grain of the nitrate of silver to the ounce of water is to be instilled every one-half hour. The compresses of alum-water are to be continued, and common salt may be added to the alum solution. This addition of salt will obviate the disagreeable photographic effects, sometimes seen where the silver trickles down the lids and cheeks.

Should the discharge become thick and creamy, the milder measures must be replaced by more active ones. An aqueous solution of alum, containing from five to ten grains to the ounce, injected from an eye-dropper every hour, will be found to give satisfaction in a large number of cases. If the lids swell much, the strength of the alum solution, in which the sheet lint is dipped, should be increased, and may often be kept ice-cold with advantage. The medical attendant should at least once a day separate the lids with the hair-pin retractors, thoroughly cleanse the conjunctiva, and after applying the solution, gently withdraw the retractors, allowing the lids to close lightly over the eye. The condition of the cornea should, of course, be carefully noted during each examination. I believe the ordinary cleansing of the eye to be superficial, and have again and again inserted the hair-pin retractors, to find, on exposing the conjunctiva, a mass of septic pus which had been retained in the conjunctival folds and in the cul-de-sac, apparently for days, notwithstanding hourly eversions of the lid and more frequent ablutions. I believe that, if the purulent discharges be thoroughly removed, at least once a day, from the entire conjunctiva, the tedious cases of ophthalmia neonatorum, which so often lead to corneal perforation, will be but seldom encountered. It is this decomposing, purulent secretion which jeopardizes the integrity of the cornea in the vast majority of cases seen in private practice.

I use as collyria, where alum fails, nitrate of silver, gr. ij.-x. to the ounce of water, or a saturated solution of boracic acid with such good results, when perfect cleanliness is maintained, that I have had no occasion to try the list of remedies, whose name is legion, with which contemporaneous periodical literature is burdened. From gr. i.-v. of hydrargyrum cum creta, given thrice daily, seems to act well in many cases. There should be no depressing measures used, unless, as some consider, the ice-cold cloths applied locally to reduce the swelling, be so regarded. The edges of the lids should be smeared with vaseline. The child should be placed under as favorable hygiene, and given such constitutional support as may be practicable. It should be kept in a well-ventilated apartment, and light excluded from the eye by compresses, rather than from the room by closed blinds.

If corneal trouble threaten, the most scrupulous cleanliness is imperative, the hair-pin retractors are to be used with due care, and the entire conjunctival sac absolutely freed from the accumulated secretion. Copious ablutions of tepid water, containing a pinch of salt, should be used every five minutes during the day, and at night every half-hour. Stronger silver solutions, containing from gr. x.-lx., are now to be used three times a day, and followed immediately by a copious douche of salt-water. The rules for employing these stronger solutions are: 1st, never cause the eyes to become more inflamed by too strong an application, and 2d, do not use strong solutions unless the discharge be abundant. Eyes differ so in their susceptibility, and the disease varies so in its severity that no "rules of the thumb" can be laid down as to the exact strength needed for a given case. As soon as any change whatever is noticed in the cornea, use solutions of atropia containing one-half grain in an ounce of water, or a ten-grain solution of the extract of belladonna. They dilate the pupil, and thus keep the iris out of harm's way so far as may be. The anodyne effects of these solutions is often very pronounced. Should the ulcer seem indolent, a change to a solution of zinc sulphate, gr. v.-xv., to the ounce often stimulates it to heal. It is sometimes needed to exert a control over the inflammation that the mitigated or solid stick should be used; its application must be followed by a free washing with salt and water. In using either the stick or strong solutions the lids should be drawn well apart by the retractors, and great care

used to avoid touching the cornea. The wine of opium, diluted with an equal bulk of water, tones up the relaxed conditions often noticed after the swelling of the lids has subsided. If a chronic catarrhal condition remain, the sulphate of copper crystal, applied twice or thrice a week, will usually effect a cure. Opacities of cornea should be left entirely alone. In strumous children, or those debilitated by an exhausting discharge, ten drops of Huxham's tincture of bark, thrice daily, acts kindly, while of late I have seen inunctions of cod-liver oil prove very beneficial.

The surgical treatment is of two kinds. That which is needful during the disease, and that employed at some future time to correct the optical defects resulting as sequelæ. Scarification of the ocular conjunctiva may be done if the cornea seem to be endangered; make the incisions radiating from the cornea and through the annular ring.

Since the introduction of *paracentesis corneæ* the proportion of cases of corneal perforation has greatly fallen off. Where there is danger of such perforation the aqueous humor should be evacuated. The site chosen is usually the most dependent portion of the cornea. This operation is to be repeated whenever the local condition demands it. By this measure we diminish the intraocular pressure, and thus remove one pressure-producing factor. The pressure may be greatly lessened, if there be spasm of the orbicularis, by slitting it where it bends around the outer canthus. A free canthotomy down to the bone should be done. It is out of our province to consider those later operations, such for instance, as iridectomy, which are done to remove optical defects, and which should be performed if there is enough transparent tissue at any point of the cornea to warrant forming an artificial pupil behind it. An operation may be demanded to relieve the iris, which is sometimes retained in a cicatrix left after a healed ulcer.

A CASE OF CONGENITAL DIAPHRAGMATIC HERNIA.

BY

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JOSEPHINE F., patient at the Nursery and Child's Hospital, native of U. S. A., aged twenty-two years, primipara, date of last menstruation not known (woman said June, 1881); began to have labor pains at 6 A.M., Friday, June 9th, 1882. Membranes ruptured at 1 P.M. Sunday; at 1 A.M. Monday, os completely dilated; 7 A.M., the head was on the perineum, and as the pains, which up to this time had been good, ceased, the forceps were applied, and a dead child delivered. Various and persistent efforts failed to resuscitate it. The child weighed 3,320 grammes (about six and a half pounds); the placenta, 544 grammes (about one pound). The presentation was the first of the vertex.

Autopsy made at 3 P.M., Monday, June 12th. The external appearance was that of a moderately well-developed male child at term. Rigor mortis was well marked. The marks of the blade of the forceps were to be seen over each parietal region. There was considerable edema of the scrotum. The face, head, and limbs were well developed, anus and urethra normal.

On opening the abdomen we only noticed the escape of a small quantity of bloody fluid, but when the sternum and ribs were removed we found that the left half of the diaphragm was almost wholly absent, there only remaining a narrow band of muscle along the costal cartilages, being one cm. broad at the sternum, and ending in a fibrous attachment to the sixth and seventh ribs, leaving a space large enough to admit four fingers, and allowing the contents of the abdomen to escape into the thorax. The hernia had no peritoneal sac, as is occasionally the case in this variety of congenital deformity. The first organ that presented was the liver, turned from right to left, so that the broad ligament was parallel with the diaphragm. The left lobe was entirely in the thoracic cavity, reaching up to a level with the third rib, and having pushed the heart over to the right side. The right lobe of the liver occupied the whole of the abdomen, its anterior border being in contact with the descending colon, the posterior border resting on the right side of the abdomen. The ligaments were normally attached, but stretched so as to admit of the peculiar position of the liver. The blood-vessels were normal in number and position; the gall-bladder was full of bile, and the liver itself intensely congested. The liver was not as thick as usual; microscopically, the cells were normal.

Continuing the examination of the thorax, the left half was seen to be occupied by the left lobe of the liver and the intestines.

The small intestine was coiled in the upper portion. The extreme left contained that part of the colon which should have formed the ascending and transverse portions, the cecum being about on a level with the third rib, and the ileo-cecal valve just below on its posterior part. The colon ran straight down the left side to the iliac region, where it passed normally into the sigmoid

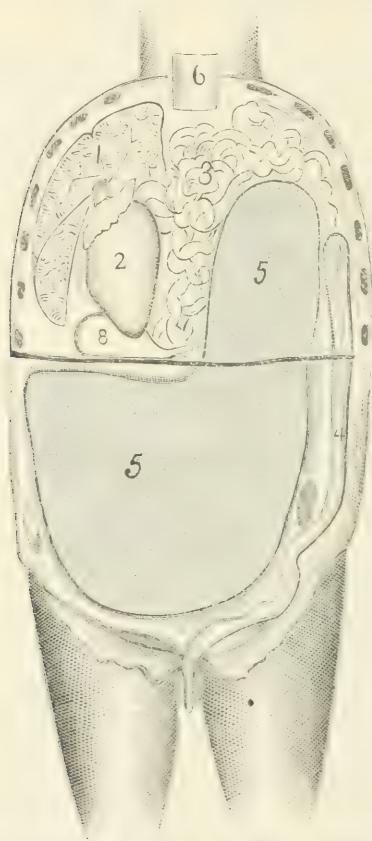


FIG. 1. Diagrammatic cut showing relation of parts: 1, Right lung; 2, heart; 3, small intestines; 4, large intestines; 5, liver; 6, thymus gland; 8, stomach.

flexure and rectum. On this left side, no lung, or even the remains of one, could be seen until the thymus gland was displaced to the right and the liver to the left, when a body, looking like a part of the thymus, well compressed against the mediastinal pleura, came into view. It was smooth, non-lobulated, attached by a short pedicle at about its middle, being two and a half cm. long, one cm. in breadth and about two mm. in thickness. When the liver was removed, the small intestines were seen to be entirely in the thorax, having a long mesentery that passed down through

the opening in the diaphragm to be attached to the posterior part of the abdomen in the upper lumbar region. It could not be traced below the third lumbar vertebra. The intestines seemed small, were empty and movable. Beginning at the ileo-cecal valve, and following up the intestines, we found everything as it should be, until we came to the duodenum lying in close relation to the vertebral column, about two cm. above the attachment of the diaphragm. Its concavity looked downwards and forwards, embracing the head of the pancreas, the tail of which organ was coiled up just below in contact with the stomach and esophagus. Following on the duodenum the pyloric end of the stomach was found about two cm. above the diaphragm on the vertebral column. The stomach was so placed that the lesser curvature was nearly vertical, and in direct contact with the tail of the pancreas. The stomach and spleen lay in a sack formed of the two layers of the mediastinal pleura, about three cm. deep and two cm. in diameter. The spleen was furthest in, and surrounded the stomach. This pocket was pushed under the heart to the right, compressing the lung, and, when the organs were in

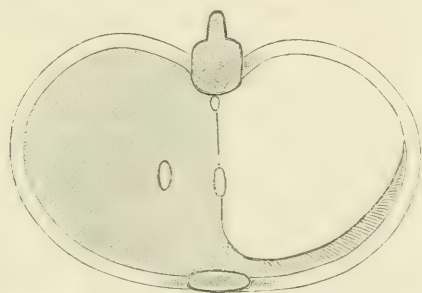


FIG. 2. Vertical section, showing absence of diaphragm on left side.

it, looked very much like a heart with its pericardium. The esophagus was found to leave the stomach near the diaphragm, then turning around a fibrous band that partly constricted it, passed up posterior to the stomach.

The heart was pushed over to the right, so that the apex was under the sternum, resting on the diaphragm, while the base was nearly up to the third rib. The position was more vertical than normal, and it was completely inclosed in the pericardium, which was normally attached. There was a small amount of clear serum found on opening the pericardium; the heart was normal in size, as were also the valves and great blood-vessels. The only thing to note was the very small size of the left pulmonary artery, and the comparatively large size of the ductus arteriosus. The right pulmonary artery was normal. The right lung was normally developed, having its three lobes, but being in the fetal state, and well pressed upwards and backwards by the intruding organs. The bronchus on the right side was normal; on the left it was only a fibrous cord, one mm. in diameter.

The pleura on the right side was normal; on the left, it passed over into the peritoneum, without any break posteriorly and laterally; anteriorly, it had the remains of the diaphragm to pass over.

The kidneys were low down in the abdomen, and very loosely attached. On section, the pyramids were very much congested, and the cortex seemed thin, measuring two to two and a half mm. The surface was pale and very deeply lobulated. The ureters and bladder were normal. Brain, congested. Placenta small but not fatty; umbilical cord normal.

The above case is undoubtedly one of congenital want of closure of the left half of the diaphragm. There was nothing during the pregnancy, as a moral or physical shock, to account for the malformation. I find one unreported case in the pathological collection of the New York Hospital, presented by Dr. William S. Halsted, 1882. Male, still-birth with hernia of the intestines, omentum, stomach, and spleen into the left pleura, with a remnant of the left half of the diaphragm like our case.

One of the first to write on this subject was Textor (*Bayr. Corres-bl.*, 1848; *Schmidt's Jahrb.*, 1848, s. 64), who collected one hundred and three cases, out of which he was sure of only thirty-five, and of these twelve were under ten years, nine being in new-born children.

Bowditch, in 1853, published a work on diaphragmatic hernia in which he had twenty-six congenital cases. As I have not seen the original of either of these I do not include them in the analysis below.

Balfour (*Edinburgh Med. Jour.*, April, 1869) reports a case of tedious labor ended by the use of forceps. The child only feebly gasped, and the autopsy showed want of the left half of the diaphragm with hernia of all the abdominal organs except the kidneys and right lobe of the liver. He adds a very able paper on the embryology, and reports thirty-two cases that he has been able to collect, seventeen of which were in new-born children.

Broomall (*AMERICAN JOUR. OBS.*, Vol. XII., p. 537), in 1879, reports a case of left-sided want of development of the diaphragm in a female still-birth, with hernia into left pleura of small and large intestine, spleen, pancreas, and stomach.

Mills, in the *Canada Lancet*, 1880 (*Medical Record*, Vol.

XVII., page 275), reports a case of a child that merely gasped and died, with want of the right half of the diaphragm, and hernia of the intestines and part of the liver.

Kocher, in 1880 (*Gerhardt's Handbuch Kindkrank.*, B. 6, II.), adds two cases to those already published. They are from the pathological collection in Berne. The first, a female fetus normally formed, in which the diaphragm was wanting on the right side, there remaining only a small strip of muscle anteriorly; right lung was atrophied, but had three lobes. The hernia consisted of right lobe of liver that was much smaller than the left, all the small intestines, cecum, and colon. The second case was a male new-born child in which the left half of the diaphragm was undeveloped, allowing the stomach, small intestines, large intestines, and spleen to pass into the thorax, displacing the heart over to the right. He then refers to five other cases, all but two of which are referred to by Lacher (*Deutsches Archiv f. Klinische Medicin*, 1880, B. 27), where he gives an account of one hundred and twenty-three congenital cases with autopsies, ninety-three of which were under seven years of age and three were cases of true hernia. He adds two cases of his own: first, a boy, constantly cyanotic, died *æt.* eleven and a half months. Was supposed to have had congenital heart disease with transposition of that organ. At the autopsy the left half of the diaphragm was wanting, so allowing part of the colon and left kidney, both covered with peritoneum, to pass into the thorax and push the heart over to the right and compress the lung. Second case was a still-born female in which the left half of the diaphragm was wanting. The hernia consisted of stomach, spleen, small and large intestines, omentum, and left lobe of the liver. The kidneys and right lobe of liver filled up the abdomen. The position of the stomach, very minutely described, resembled our case.

From the above literature we are able to collect one hundred and fifty-one cases, but as we cannot analyze those of Textor and Bowditch, the number is reduced to 113 cases of congenital hernia under seven years of age. This peculiarity occurred in males forty-one times, females thirty-five times, sex not mentioned thirty-seven. The diaphragm was wanting eighteen times on the right and eighty-three times on the left side, or four and two-third times oftener on the left. There were

only five cases of a true hernia, that is where the organs were contained in a pouch of peritoneum. Four times the hernia occurred in the middle part of the diaphragm, twice both sides were open, leaving a piece in the middle, and once there was no diaphragm at all. This case was also very much deformed. All the abdominal organs except the bladder have been found in the thorax. The stomach and intestines most frequently, the kidneys only very rarely. The liver and spleen in about half the cases. In three cases the reports did not state what part of the diaphragm was wanting. The etiology is unsatisfactory. The reason given for the greater frequency of the hernia on the left side are weakness of the left half of the diaphragm and the support that the liver gives to the right. The symptomatology varies very greatly in different cases, but in the variety herewith reported, generally the child lives but a short time, and the difficulty of respiration, cyanosis, dulness on percussion, abnormal position of heart, would seem the signs most to be relied on.

REVIEWS.

A PRACTICAL TREATISE ON THE DISEASES OF CHILDREN. By J. FORTSYTH MEIGS, M.D., and WILLIAM PEPPER, M.D., LL.D. Seventh edition. P. Blakiston, Son & Co.: Philadelphia.

The seventh edition of this treatise, just issued, gives evidence of an earnest endeavor on the part of the authors to embody in it the discoveries and improvements made in pediatrics since the issue of the preceding edition. The book opens with remarks "on the clinical examination of children," in which valuable information and advice are given in reference to the examination of children in sickness. These remarks will be especially useful to junior practitioners.

The diseases which our authors first consider are those of the respiratory apparatus. Coryza, simple and spasmodic laryngitis, are fully described, and judicious advice given as regards their treatment. The next malady which engages attention is one of great importance—to-wit, pseudo-membranous laryngitis. Although there is a malady strictly local which is properly designated by this name, a malady which has no relationship with diphtheria, and which occurred in this country before the appearance of diphtheria, yet, as is well-known, this disease is rare; while laryngitis with a pseudo-membranous exudation is frequent as a local manifestation of diphtheria. Probably, in nineteen cases out of twenty

in localities where diphtheria prevails, this very dangerous laryngeal disease is diphtheritic, and the patients require stimulating and sustaining remedies, appropriate for the primary malady. Now, it is impossible at the bedside to make the differential diagnosis between the strictly local pseudo-membranous laryngitis and the diphtheritic, but, from the great numerical excess of the latter cases, the physician, in a locality where diphtheria prevails, will seldom err, if he employ the remedies which are appropriated for diphtheria. Therefore, the emetic treatment recommended by the authors, we are fearful, will do harm. Frequent emesis, by which food and stimulants are rejected, cannot fail to reduce the strength and weaken the force of the cough, which expels muco-pus and shreds of pseudo-membrane, and thereby it diminishes, rather than improves, the chances of a favorable result. "The alum is given in powder, in the dose of a teaspoonful, mixed in honey or syrup, or in syrup of ipecacuanha, to be repeated every ten or fifteen minutes, till it operates. . . ." "We have given alum in the dose above-mentioned every four or five hours for two or three days, without observing any bad effect to result from it. . . ." "We conclude these protracted remarks upon emetics with the statement that, from what we have read, and from personal experience, we are induced to regard them as the most important remedies we have to oppose to this fearful malady." The occasional employment of an emetic which acts promptly and with little depression, highly recommended by Prof. Fordyce Barker as far back as 1870, who employs the turpeth mineral, is without doubt useful, but teaspoonful doses of alum every four or five hours will not generally meet the approval of those who have had experience with pseudo-membranous croup (diphtheritic) in this country; for, if the stimulants and nutriment be vomited every third or fourth hour from the use of such doses, the stage of fatal prostration would, in our opinion, be inevitably hastened. Fatal as is this disease under any mode of treatment, measures which husband the strength and do not weaken the force and expulsive power of the cough should, we think, be usually employed. In New York, the almost constant inhalation from the steam atomizer of a solvent spray, as lime-water, containing two per cent of liquor potassæ, is regarded by most physicians as more useful than any form of internal medication, and if it fail to relieve the patient, tracheotomy is believed to be the only alternative.

The remaining inflammatory diseases of the respiratory system are treated of at length, and, we think, for the most part, judiciously; though, if less space were given to the discussion of old theories and practices, and more prominence to new and more useful remedies, the wants of the daily practitioner would be more fully met. In the remarks relating to the treatment of pertussis, the half-page devoted to blood-letting, which is now obsolete treatment, might be omitted, and the description of the various anti-spasmodics, formerly employed, might be abridged, with gain in the value of the book, since these remedies are being superseded by inhalations which are found much more effectual.

The chapter on food contains many important facts collected from standard writers. The authors quote the observations made in the New York Infant Asylum and New York Foundling Asylum, in order to determine the quantity of milk which infants require. These observations had the conditions of scientific exactness. A sufficient number of nursing infants in good condition

were weighed before and after each nursing during twenty-four hours, and the results have been grouped in tables according to the ages of the infants (see Smith's *Treatise on Diseases of Children*). Observations were first made upon twelve infants under the age of five weeks, and it was ascertained that each of these infants, on the average, received in nursing 12.41 fluid ounces in twenty-four hours, and, as the average number of nursings for each during the day was eleven, the average quantity received at each nursing was only a little more than one fluid ounce. Similar observations for infants between the ages of five weeks and fifteen months showed that the average daily quantity of milk obtained by each was 24.65 fluid ounces, or double that required for the sustenance of new-born infants. Fairbanks' scales were used, weighing to the half-drachm. Our authors dissent from these carefully conducted observations, believing that the quantities stated are too low. Although we may question their opinion in this regard, we are happy to state that we consider the chapter on food a useful addition to the volume, and one that will abundantly repay perusal.

The diseases of digestive and nervous systems are fully treated of, and most of the remedies which have been employed for these maladies during the last half century are mentioned.

In the treatment of eclampsia the warm bath, cold to the head, the occasional abstraction of blood in "strong and vigorous" patients, the use of a purgative, especially calomel, followed in one to two hours by a dose of castor-oil or rhubarb, and sinapisms to the feet are recommended. Then our authors continue, "Antispasmodics are very valuable remedies, but as they are somewhat slow in acting, we should first resort to the means already detailed." "The bromides . . . are the most powerful and reliable remedies of this class." "They may be given in doses of three to five grains three or four times a day." The use of hydrate of chloral, as an enema in mucilage, is also spoken of in the same connection with the use of asafetida and valerian.

An attack of eclampsia should be controlled as quickly as possible, as its continuance involves danger, and when we consider how promptly the bromides and chloral act, it seems strange that the authors should recommend to postpone their employment till after the use of the baths, purgative, etc. We never fail to give a dose of bromide of potassium every ten minutes as soon as it can be obtained from the apothecaries, and continue its use till the convulsions cease, instead of giving it three or four times daily; and if the convulsion be not arrested within half an hour we give three to five grains of hydrate of chloral dissolved, not in mucilage, but in one or two teaspoonfuls of plain water, per rectum, employing a small glass syringe. This treatment, which is entirely safe, has put a stop to any attack of eclampsia which we have witnessed. But it may be necessary to repeat the chloral, in half an hour or an hour.

Scarlet fever very properly receives a large share of attention, the chapter relating to this disease being one of the best in the book. The skin diseases also receive more attention than is usually bestowed upon them in a treatise relating to the maladies of children.

In conclusion, we congratulate the authors for preparing so good a book for the use of American practitioners. Its general scope is good and its teachings sound, although we may dissent from some of the theories and modes of treatment.

J. LEWIS SMITH.

LECTURES ON DISEASES OF CHILDREN. A Handbook for Physicians and Students, by DR. EDWARD HENOCK, Director of the Clinic and Polyclinic for Diseases of Children in the Royal Charité, and Professor in the University of Berlin. New York: William Wood & Co., 1882.

This book constitutes the issue for March, 1882, of "Wood's Library," and is a translation from the German. That it is also a condensation may be gathered from the fact that the parent volume contains 743 pages, while 357 pages comprise the one before us. This rather startling reduction has been accomplished by the omission of many case histories and other abbreviations in the text. This last is unfortunate; for the reader frequently finds himself unable exactly to comprehend the author upon certain important points, as will presently appear.

The author begins his book with the statement, "Diseases of children are usually regarded as a specialty, but I consider this a mistake, as almost all diseases of childhood are found in adult life." He then gives the reasons why diseases of children are considered a specialty: (1) Because certain diseases are observed in them most commonly and most strikingly (prägnant), and (2) because children require special skill in their management and examination. He ends this paragraph by complaining that the faculties only obstinately refuse to take these views, and, "protected by superannuated statutes, whose boundaries have long been effaced, refuse to pediatrics the right of an individual chair." If our author considers this a mistake to regard pediatrics as a specialty, why does he urge a special chair? It would seem that we are here dealing with a contradiction.

Given one who has, after studying general medicine a given time, devoted most of his attention to the diseases of a certain organ or apparatus or to a certain class of patients, is not he, strictly speaking, a specialist? It is true that an absolute separation from the parent science is impossible; not even that most highly developed of all specialties—ophthalmology—could be for a moment conceived of as existing distinct from general medicine. Professor v. Recklinghausen was in the habit of relating how he had been asked by a distinguished pathologist to join in making pathological anatomy a science distinct from medicine. But this is the other extreme, and if we are to have specialties, and their existence is being tacitly accepted, diseases of children must be classed as one. This introduction and a very brief paragraph on the causes of mortality in children lead us to an excellent chapter upon the examination of children. It is but fair to state that we miss a chapter upon the physiology of infancy and childhood, but the further perusal of the book will bring us to the conclusion that the author prefers to insert the physiology when he applies it to a disease under discussion. And yet not too much can be done to inculcate the principles which form the basis of an understanding of diseases of children, for upon a knowledge of the physiology and anatomy of childhood, more than upon that of pathological processes, we depend for our thorough understanding of the differences as they exist between the same disease affecting an adult or a child.

The next section of the book is devoted to Diseases of the New-Born, and gives a condensed but complete account of the present state of our knowledge thereon. This is followed by the second part—Diseases of Infancy. In the first chapter on atrophy we find the author's views on infant feeding, and we are glad to see that

he does not forget Nestle's food. This article of food has been, as we think, unjustly attacked because of Zweifel's finding it undigested in a dead child's stomach (!), and Biedert (*Die Kinderernährung im Säuglingsalter*), engrossed with his cream mixture, condemns the article as absolutely valueless. Regarding Biedert's cream mixture, our author states that he could not convince himself that it was "more efficacious than feeding with cow's milk or Nestle's flour." In connection with dyspepsia, H. recommends the internal administration of calomel in small doses (0.005-0.015) every three hours, as has lately been done by Bazinsky, Wiederhofer, and a number of others, believing that its action is antifermentative. From the so-called antiseptics he, like nearly every one, has seen little benefit, and notwithstanding the severe strictures upon astringents found in some of the late articles on catarrhal troubles of the intestine, he recommends bismuth, nitrate of silver, and, in intestinal catarrhs, even calumbo, tannic acid, and acetate of lead.

The diseases of infancy are terminated by a chapter on Teething. Here we find the author "recognizing the services rendered by restricting" the diseases due to teething, yet not willing to go too far in this direction. Indeed, the nervous reflex phenomena are distinctly recognized by the author and, as concerns him, the views of Fleishman do not seem to have fallen upon fertile ground. H. is very emphatic concerning the practice still much in vogue in this country of scarifying the gums. He claims, as is almost universally done, that it is absolutely without benefit, and in some cases even harmful. We also meet here with the unusual statement that the four anterior molars appear after the lateral incisors have come through, the majority of authors (Barthez and Rilliet, Vogel, Gerhardt, etc.) claiming the opposite. Indeed, the diversity of opinion that exists among authors on a subject that ought to be so well fixed as teething, is quite remarkable. Especially true is this concerning the time of appearance of the various groups. One always suspects the statement of a late prurition as being the result of observation from slightly rachitic children. An average of long-continued observation made in this country, where rickets is not so common as abroad, ought certainly to furnish valuable information concerning the times of normal teething.

We leave the infantile period with first teething, and come to a discussion of the chapters on diseases of children. The first division includes Nervous Diseases, and, under the head of convulsions, he claims that, although dentition may provoke them, the physician "should always examine for other exciting causes," and as for worms, the author states definitely and plainly that he has never seen a case in which helminthiasis was the cause of convulsions. The author's views regarding chorea and rheumatism are best summed up by a quotation, "in my opinion the cardiac affection has nothing to do with chorea;" both are due to the same cause—viz., rheumatism, which appears to act in some unexplained manner upon the centre of co-ordination." In infantile paralysis, H. does not believe that the sphincters always escape. He also reports a case in which the facial nerve was implicated—not, however, related with sufficient detail to allow us to be positive regarding the nature of the lesion. This is one of the instances where condensation has crippled the translation. In this place twenty-six lines of German fine print are reduced to nine lines of the same type. We are glad to see that for one Henoch does not ascribe

spinal paralysis either to catching cold or to teething. In connection with meningitis tuberculosa, the author disclaims anything characteristic for the vomiting; lays particular stress on the variability of the pulse, the least exertion sufficing to run it up from 96 to 120. Here, again, the translator finds it convenient to omit several instructive cases that H. reports.

The next part of the book is devoted to the Diseases of the Respiratory Organs. Here we find our author claiming the non-identity of croup and diphtheria, and applying the most extreme antiphlogistic measures in inflammations of the larynx, whether croupous or catarrhal, provided there is stenosis. The armamentarium of the physician of the past is again brought out here—leeches, inunction of mercury, fly-blisters, etc. It is certainly astonishing to see Prof. Henoch insisting upon the benefit obtained by such treatment, and citing a case in evidence, where in all human probability this case of catarrhal croup would have recovered without any aid whatsoever.

It would be interesting to compare the results of so-called homeopathic practice with this other extreme, and we would venture to say that the statistics of the small pills would, in catarrhal croup, show as good results as those of the mercurials, leeches, and vesicants. We are, indeed, astonished to see the free use the author makes of leeches, cups, dry and wet, in inflammations affecting children; even that most debilitating of diseases, catarrhal pneumonia, is treated cautiously by antiphlogosis. In croup no mention is made of the topical applications to the throat, either by inhalations or otherwise; but the early performance of tracheotomy is advised. In discussing pulmonary tuberculosis in relation to cheesy degeneration, we find that H. "cannot believe in their essential difference," and it seems that especially in children this relationship is particularly clear.

The chapter on Diseases of the Circulatory Organs is confined to a discussion of the congenital diseases of the heart and inflammatory affections of that organ.

The Diseases of the Digestive Organs begin with a short but exact and complete description of the affection of the buccal mucous membrane, of which the author describes three forms—simplex, aphthosa, and ulcerosa; he having described the parasitic form under the general division of infantile diseases. The diseases of the intestines are not separated from each other according to the locality that gives rise to the diarrhea, as we find it in Wiederhofer's admirable exposé (Gerhardt's "Hdbch. d. Kinderkrankheiten," v. iv., 2); and we shall lay special stress upon this division, as the treatment must necessarily vary according as we are dealing with a catarrh of the small or the large intestine.

Part VII. is devoted to Diseases of the Uropoietic Organs; and the author, in discussing Ultzmann's method of faradization for incontinence of urine, makes a statement which will be corroborated by very many who have used this method frequently. He says that electricity acts, "if at all, through its psychical influence." Not infrequently have we seen one or two applications of this method act by causing complete cessation of the symptoms, sometimes only temporarily, where the possibility of the strengthening of the sphincter vesicæ was entirely out of the question. Ultzmann makes reference to such cases, but refers the success, not to a psychical, but direct nervous influence. More frequently, however, we have seen no results follow, especially in young children; and, although

Ultzmann does not give us a table of his cases, yet we are allowed to infer from his article that most of his cases were in older children.

Parts VIII. and IX. are devoted, respectively, to Infectious and Constitutional Diseases. The chapters upon scrofula and rachitis are of especial interest. The author gives us a complete description of the symptoms, and truly states that the etiological relations of the one are as dark as those of the other.

The last part deals with Diseases of the Skin. This is decidedly the weakest part of the book; weak in its brevity. Henoch apologizes for this, though, by saying that he omits all skin affections not strictly confined to, or presenting peculiarities when occurring in children.

By the process of condensation the translator has scarcely done justice to Henoch. A great many interesting and instructive cases have been omitted. Trite and original remarks are not to be found, and, therefore, the general character of the work is altered. Yet, with all this, the book as presented to the subscribers to the "Library" is distinct and valuable; its structure and composition bearing the impress of a trained and experienced teacher.

F. FORCHHEIMER.

ABSTRACTS.

Prepared by J. FEWSMITH, JR., M.D., and THOMAS T. GAUNT, M.D.

1. Wharry: Croton Chloral in Whooping-Cough (*Lancet*, April 29th, 1882).—In a letter to the London *Lancet*, dated April 24th, Dr. Robert Wharry speaks of the value of croton chloral in whooping-cough being as great as the salicylate of soda in rheumatism. Many severe cases, in which a fatal result threatened, yielded beyond expectation to the drug. He claims that croton chloral is a safe remedy, and is best given to children in small, oft-repeated doses, which may be increased from day to day. He finally suggests that possibly it acts by producing a certain degree of anesthesia of the vagus or respiratory centre. T. T. G.

2. Snell: A Group of Syphilitic Inoculations Caused by a Suckling Infant (*Lancet*, April 1st, 1882).—This series of cases is interesting, not only from the mode of inoculation, but also from the number of the sufferers. A young woman, aged twenty-six, contracted on her right breast an initial lesion. It was caused by nursing a child suffering from some of the active manifestations of inherited syphilis. This was during her employment as a wet-nurse. Before the sore appeared on her breast, however, she discontinued her services, returned to her home, and began again to nurse her own child. In due course of time the sore appeared on her breast, as above described, and later a similar sore was noticed on the lip of her child, which she continued to suckle for some time. As the sore developed, nursing the child caused the mother so great pain that she was obliged to call for assistance on the child's grandmother, who had but recently weaned a child. The grandmother nursed it for a certain period, and ultimately developed a hard chancre on the right breast. She presented herself for treatment, and an investigation revealed the foregoing somewhat complicated history.

The grandmother had the usual secondary manifestations. Her daughter had, following the initial lesion, well marked secondary symptoms, while, lastly, the child had, subsequent to the sore on the lip, active syphilitic phenomena, and finally died.

T. T. G.

3. Eagar: An Unusual Case of Intussusception in a Child (*Lancet*, April 15th, 1882).—The following case is remarkable from (1) the *great amount* of gut invaginated in an *unusual position*; (2) so sudden a development of the symptoms; and (3) a fatal termination resulting in twelve hours. The history is this: A girl, aged eight years, was suddenly seized with intense pain in the abdomen, accompanied by vomiting of partly digested food. The parents ascribing this to indigestion, neglected to send for medical assistance for some time. On the physician's arrival, he found the patient in a state of collapse, from which she never rallied. As the child presented such violent symptoms and died in so short a time, it was thought that an irritant poison might have been the cause of death. The post-mortem examination revealed the intestines in a gangrenous condition. The stomach presented nothing abnormal. On tracing the duodenum downwards, about four inches from the commencement of the jejunum, the gut was found to be intussuscepted for a length of eighteen inches, and was gangrenous from that point to within three feet of the ileo-cæcal valve. The other viscera were normal.

T. T. G.

4. The Present Epidemic of Whooping-Cough in London (*Lancet*, April 22d, 1882).—The *Lancet* states some startling facts, and makes some pertinent suggestions regarding the present exceptionally fatal epidemic of pertussis. The disease assumed an epidemic character at the close of 1881. During the first thirteen weeks of 1882, two thousand two hundred and twenty-four deaths from this disease had occurred in London. From the year 1841 to 1880, the rate of mortality from whooping-cough has been singularly stationary. There were notable epidemics of the disease in 1878 and 1880. The present epidemic is, however, more severe than any in recent years, and at present shows little sign of serious decline. Public health officers cannot refuse to recognize that whooping-cough mortality is really in a general sense preventable, and the more general recognition of this would be an important step in the direction of its reduction. The article concludes with calling attention of the metropolitan officers of health to this fatal and somewhat neglected disease which, since the beginning of the year, has caused the sacrifice of more than two thousand five hundred children.

T. T. G.

5. Bridger: Nitrite of Amyl in Infantile Convulsions (*Lancet*, April 22d, 1882).—In a communication to the London *Lancet*, Dr. Bridger relates five cases of infantile convulsions successfully treated by inhalations of amyl nitrite. The first was a case of cerebral abscess in a boy three years old. The convulsions had been severe and prolonged, but yielded perfectly to amyl nitrite, which was floated on mucilage, and inhaled on the least sign of a fit. In the second case, a boy of six, suffering from tubercular meningitis, had been in almost constant convulsions for two or three days. The similar use of the amyl nitrite was followed by marked improvement, the twitchings almost entirely ceased, and the child had some hours of sleep. The drug was discontinued on the fourth day, as the increased doses which had to be used caused much panting.

Cases three and four were very young children, aged respectively five and nine months. The convulsions in both cases were traceable to dentition, and both yielded perfectly to the inhalations. Case five, a child one year old, suffering from typical spastic rigidity, the history pointed strongly to dentition as the cause. The rigid flexion of the fingers and toes loosened, as by magic, during the inhalation of the drug. They, however, returned later, and the case passed from under observation. He refers to other similar cases successfully treated by the same agent. He thinks it so safe a remedy that its use as an inhalant may be left in the hands of people of ordinary intelligence. He further says that, in the convulsions of children, this drug seems to combine in itself the temporary usefulness of chloroform inhalation and the more lasting effects of such drugs as the bromides. Of course, it is only treatment directed to the relief of a symptom, and therefore simply an adjunct to the rational treatment of a morbid state. It should be remembered, however, that this symptom is occasionally the direct cause of death, by producing asphyxia.

T. T. G.

6. Gould: Spina Bifida Successfully Treated by Injections of Iodo-Glycerin (*Lancet*, May 6th, 1882).—MR. GOULD, at the London Clinical Society, detailed the successful treatment of a case of spina bifida. The patient, a male aged six months, healthy and well-developed, having neither paralysis nor talipes, presented a sessile tumor about the size and shape of a tomato, and situated over the lumbar spines. The tumor was fluctuating and translucent, covered with healthy skin, became very tense when the child cried, while pressure on it caused a fulness of the anterior fontanelle. The tumor had been steadily increasing in size since birth. One drachm of Morton's iodo-glycerin solution was injected after the withdrawal of an ounce of the contained fluid. No effect being produced, the injection was repeated the following week, using one and one-half drachms of the same. No bad symptoms occurred. The tumor, first becoming solid, shrank until it remained as a puckered fold of skin only. The fluid removed was analyzed by Dr. Dupré who failed to find even a trace of sugar, showing that it was arachnoid, and not subarachnoid fluid, and Mr. Gould pointed out that this was the most favorable variety for radical treatment. He referred to three other cases under his care similarly treated. In one, the child died after the second injection from suppurative spinal meningitis; a second was lost sight of; in the third, the sac consolidated, but the child died of concurrent hydrocephalus. Prof. Lister, in commenting on the case, said he thought the treatment used the best at present known. He recommended that no fluid should be withdrawn, however. He had concluded, after a fair trial, that antiseptic drainage or incision did not offer a prospect of success.

T. T. G.

7. Gould: A Case of Congenital Intestinal Obstruction (*Lancet*, May 6th, 1882).—This case was also presented by Mr. Gould. A child, aged three days, suffered from the usual symptoms of chronic intestinal obstruction. The belly was opened above Poupart's ligament, on the left side. A coil of distended small intestine presented, and as no distended large intestine could be found, it was carefully stretched to the edges of the incision, and opened. A large amount of meconium escaped. The advantages of opening the belly in the groin in preference to lumbar

colotomy were insisted upon. The child died twenty-one hours afterwards. At the autopsy, there was no evidence of peritonitis. The cecum, the lower four inches of the ileum, and the first four inches of the colon, were filled with a firm whitish plug of inspissated mucus of the consistence of cheese, which was firmly applied, but not adherent to the mucous membrane. Beyond this, the colon and rectum were empty, and contracted to the size of a clay pipe-stem. Above it, the small intestine was distended with meconium and gas. It was pointed out that here there was no fault in development, but obstruction from a plug.

T. T. G.

8. Sneddon: Injury Peculiar to Children, Probably Dislocation of Either End of the Radius (*British Medical Journal*, April, 1882.)—

DR. W. SNEDDON claims that this peculiar injury warrants more attention than it has so far received. The dislocation may occur either at the elbow or wrist; when it occurs at the former, it seems to be a slight displacement of the head of the radius forwards, and probably outwards, when occurring at the wrist, however, it is probably a displacement of the lower end of the radius usually. A typical case is this. The child suffers pain in the arm, with inability to lift the forearm, or to catch anything offered to it; with the arm not quite semi-flexed, and the forearm fully pronated as a rule. In ten cases which he had examined, the injury was situated at the elbow seven times, and three times at the wrist. There is seldom any deformity to be seen or felt; but, when the forearm is supinated and then flexed, a slight *click* is usually heard, or felt, and the pain vanishes in a minute. If one now offer a coin to the child, it will lift its arm and catch hold of it at once. In some cases it is needful to flex the hand, in order to reduce the dislocation. The injury is very apt to recur, and may not do so at the same seat, for in one case the injury was at the wrist twice, and once at the elbow. Most frequently the injury is done by some one catching hold of the hand of the child, who was then dragged towards them.

J. F., JR.

9. Dreschfeld: Progressive Facial Hemiatrophy in a Child (*British Medical Journal*, April, 1882.)—

A girl, aged nine and a half years, affected with this very rare form of disease, was presented to the Manchester Medical Society, by Dr. Dreschfeld. The atrophy affected the left side of the face. It came on without any particular cause, four years ago, and seemed to be gradually progressing. The parts affected were the skin, the subcutaneous tissue, and the lower and upper jaw, on the left side; all the muscles, except the left half of the tongue, which were atrophied, were healthy. The disease was not accompanied with any pain, and the sensibility of the affected half of the face was normal to touch, pain, and temperature. The blood-vessels were not affected; the temperature of the two sides was equal. The sebaceous secretion was diminished on the left side, the secretion of sweat and saliva were not altered. The teeth and hair were likewise unaffected. The diseased process had, as yet, not reached the bones of the orbit, or skull, to any appreciable extent, nor were the cartilages of the nose or ear implicated in the process. The pupils were equal, and reacted well to light. The electrical reaction of the muscles to the galvanic and faradic current was increased to the left side, owing, no doubt, to the thinness of the skin on that side. The general health and growth of the patient were in no way interfered with by the atrophy. As regards the pathogenesis of this rare

and peculiar disease, this case again showed that the atrophy was not due to an affection of either the facial, the sympathetic, or the motor or sensory portion of the fifth nerve, but that it is a "tropho-neurosis," following the course of the fifth nerve, in the sense in which Romberg first enunciated it. From the atrophy of the left half of the tongue it would seem that the disease was rather centric than peripheric, implicating the trophic centre of the fifth, and in part the nucleus of a neighboring nerve.

T. T. G.

10. Duncan: Poisoning by Bromide of Potassium (*British Medical Journal*, April 29th, 1882.)—A child, aged three years, took by accident eighty grains of bromide of potash, dissolved in four ounces of camphor water. His parents stated that in ten minutes he looked pale and at the same time his lips became blue. In a few minutes more he was dead. Rigor mortis set in early. It is evident that the camphor water played no part in producing a fatal result, for Berzelius estimates that only one part in a thousand of camphor is taken up when triturated with water, and even less is dissolved when the crude process of the Br. Ph. is employed. The absence of convulsions further proves that the camphor present had no influence.

T. T. G.

11. Green: Infantile Diarrhea (*British Medical Journal*, April 29th, 1882.)—MR. CHARLES GREEN has for some time been engaged with Dr. Ballard in investigating the causes of infantile diarrhea. Their work has been carried on in connection with the general inquiry into this subject that was made in various large towns in England during the past summer. He includes in his last annual report an interesting abstract of the cases which came under his notice. Eighty per cent of the cases were under one year of age, ten between one and two years, five between two and five, and five were over three years. Seventy-five per cent were sudden and acute, and the remaining twenty-five were chronic. He is inclined to think that, while improper feeding is to some extent the cause, this is not so much the case as is generally supposed. Insanitary surroundings are the principal causes of the disease. He especially draws attention to the condition of the ash-pits in his district during the summer as having been a fruitful cause of the very prevalent diarrhea. The wholesale throwing of slops into the street gutters, and the dirty condition of many of the houses, assists also, in his opinion, by polluting the air, in propagating the disease. As to the influence of heat, it was noted that, of the eighty-two deaths which happened during the year, ten were registered in July, thirty in August, and ten in September; *i. e.*, about one-half the cases occurred in the third quarter of the year—the only time when there was any summer heat. He believes the action of heat to be of two kinds: (1) it probably relaxes the tone of the system, and predisposes to disease; and (2) it principally acts by assisting the process of fermentation in ash-pits, deposits of rubbish, slop-pools, etc., which surround the greater number of patients who suffer from this disease. Heat also acts in assisting the fermentation of milk and other food kept under insanitary conditions; and food that has begun to ferment almost always causes diarrhea.

T. T. G.

12. Kiernan: Insanity from Scarlatina (*St. Louis Clin. Record*, Jan., 1882).—DR. J. G. KIERNAN (Chicago) arranges the psychical phe-

nomena which arise from scarlet fever in three classes: First, those in which hallucinations and motor phenomena make their appearance, accompanied by depression of an agitated type. Second, those in which dementia results from the disease. Third, those in which a marked change in the patient's character occurs. In the first class, hereditary taint was found very marked.

CASE I.—D. P., æt. 6; family history showed marked neuropathic taint in grand-parents, parents, and brothers and sisters. In this girl, the scarlet fever ran its early stages in the usual way. About the fifth day after the appearance of the eruption, the temperature suddenly sank from 104° to 98° , and the child became extremely restless and violent. About two weeks before this, she had been frightened by a Chinaman. She now complained that she saw this man's face at the window, and that his hands were stretched out to grasp her. This condition continued for two days, and then gave place to one in which the child was greatly agitated and very incoherent, and at the same time very much depressed. She remained in this condition a week, and then fully recovered. The treatment was by conium and cold packing. II.—While this child was ill, her sister, 9 years old, was taken sick, and about the seventh day of the fever, the temperature, which had ranged from 102° to 106° , fell to $98\frac{1}{2}^{\circ}$, and symptoms like those of the first case appeared, followed by marked hallucinations of hearing. She claimed to hear some one calling to her: "Help! help!" She had no other hallucinations. These persisted a week, then gave place to the depression, after ten days of which she fully recovered. III.—The next case, J. H., æt. 8, was also of a very neuropathic family, epilepsy and intemperance running in all its branches. The fever ran its usual course till the fourth day, when the temperature fell from 107° to $98\frac{1}{2}^{\circ}$. The patient was extremely stupid for twenty-four hours. Then he became agitated and restless, poked cotton in his ears and shut his eyes, complaining that he saw rats running all over the room, and heard them squeaking. Five-minim doses of tinct. cannabis indica were given every four hours. No effect was produced for two days, when he sank into a deep sleep, which lasted ten hours, and from which he woke exhausted, but in normal mental condition.

That these three cases had scarlatina as exciting cause there can be little doubt. The influence of strong antecedent impressions was shown in the hallucinations regarding the Chinaman in the first case. The second child had heard the cries of her sister for aid against the Chinaman. In the third case, the boy's sisters had remarked that there were rats in a closet down-stairs. In all three the temperature had risen higher than in reported cases, and the duration also differed.

Of the second group, K. mentions only two cases seen by him in the New York City Asylum for the Insane. The first case was a marked dement, with impaired memory and perception. He had been a bright boy up to the age of 17, when he was attacked with scarlet fever. In the stage of desquamation there was a marked increase of the fever, followed by delirium. On recovering from the delirium, the patient was found to be in the condition above described. The second case was in a man of thirty, whose only evidence of mentality was his always repeating "sixty-six," and who could only be induced feed himself after a spoon had been placed in his hands, and several times lifted from the dish to his mouth. Like the former case, he had been mentally sound up

to the age of 18, when he was attacked by scarlet fever, followed by meningitis, which left him in this condition. It is probable that, in these and analogous cases, there has been a meningeal process set up which becomes meningo-encephalitic in character, and the so-called dements are occasionally reported as becoming victims of progressive paresis.

The third group of cases are very frequent. They do not reach asylums, but every practitioner sees them.

From these cases, and those seen by Mendel, Kräpelin, and Rabuske it seems safe to conclude:

First, that three groups of mental phenomena are produced by scarlatina, independently of delirium, two of them being classable as insanity, while the third is not. Second, that the first is a species of melancholia agitata attended by hallucinations, and its inception preceded by a decline to normal of the high temperature previously existing. Third, that the second group consists of cases of dementia, due to meningitis of scarlatinal origin, the patient passing from the hyperpyrexia of scarlatina to that of meningitis, on recovery from which he is found to be demented. Fourth, the third group of patients show either marked change from the character antecedent to the attack of scarlatina, or else retain in after-life some of the juvenile characteristics of the period prior to the attack.

J. F., JR.

13. D. E. Kormann: Artificial Nourishment of Sucklings with Cow's Milk and Paulcke's Milk-salts (*Jahrbuch f. Kindhlkde.*, XVIII. B., 1 H.).—What Dr. Kormann writes on this subject must always be of interest. It is now universally acknowledged that cow's milk is the best artificial food for sucklings, and generally believed that that obtained from dry fodder is superior to all others. Our task now is to so dilute this and make such additions as shall make it most digestible. Passing over Kormann's arguments we find two principal points in his article. The first is that barley or oat water (Jacobi) is by all means the best diluent. Kormann uses it in different proportions from Jacobi, viz., in the first month, one part milk to three parts of barts of barley-water. In the second month, one to two. In the third, equal parts. In the fourth, two parts of milk to one of water. In the fifth, three to one, and from the sixth to the ninth, one part of water is still added to four parts of milk. Where there is a tendency to diarrhoea, oat-water may be advantageously substituted for the barley-water. This alone gives good results, but occasional attacks of dyspepsia will arise accompanied with colic and the evacuation of undigested curds. To avoid this, Kormann has experimented with Paulcke's milk salts. He describes in full the preparation of the salt, and Paulcke's method of using it.

The preparation comes in packages of ten portions, each containing 12 gm. milk salts. Kormann believes that Paulcke's directions make the food too concentrated and uses the preparation as follows: In the first month one portion or 12 gm. of the milk salts is dissolved in 250 gm. of barley-water. Unto this are added only 80 gm. of dry fodder milk (3 : 1). In the second month, 125 gm. of milk are added (2 : 1). In the third month, 250 gm. (1 : 1). In the fourth, 500 gm. (1 : 2). In the fifth, 750 gm. (1 : 3). By this means, there is no doubt that the milk is much better preserved and made more easily digestible. Kor-

mann then gives tables of body-weight to show that this form of nourishment is of absolute benefit, and concludes that Paulcke's milk salts, especially for the summer time, is an important preparation and worthy of general use.

J. F., JR.

14. A. Steffen: Conquinine and Hydroquinone (*Jahrbch. f. Kindhlk.*, XVIII. B., 1 H.).—Conquinine is a quinia alkaloid the chemical constitution of which is already known. The sulphate is generally used. It occurs in whitish easily decomposing crystals, tastes bitter, becomes of an orange color on the addition of liq. ferri sesquichlor., and with nitric acid shows a bluish shimmer on the upper edge of the fluid. It is given in liquid or in powder, generally at evening, the average dose being two grammes given in two parts with a half-hour between. This is the adult dose. Its action is characterized by a decided lowering of the temperature averaging 4° F. This does not follow suddenly, but comes on gradually and remains a long time, sometimes over the next day. Other effects are quite frequently vomiting and diarrhoea, sometimes ringing in the ears, more rarely deafness, and only occasionally headache, vertigo, and delirium. It is contra-indicated in cases of cardiac weakness and irritable stomach. The frequency of the pulse is generally diminished, the respiration not much affected. The secretions in general are increased. It occasionally causes great cardiac weakness and irregularity, and the author concludes that in large doses such as are necessary it is rather a dangerous remedy for children.

Hydroquinone.—Three materials are derived from benzol: pyrocatechin, resorcin, and hydroquinone, the latter being a para-derivate. In appearance it resembles salicylate of soda. It dissolves partially in cold water, rapidly and completely in boiling water. Cold solutions exposed to the light become wine-red. Liq. ferri sesquichlor. colors the solution clear green or yellow. Nitric acid colors it orange. It has been used here and there, but first methodically tried by Steffen in various febrile diseases. He first described it in a case of typhus in a boy of eight years. The fever disappeared on the twentieth day, and on the fortieth, the boy was discharged cured. The hydroquinone was given in powders of 0.5 each, generally twice a day, twenty grammes being taken altogether. The antipyretic action of the drug was as follows: from two to four hours after it was taken, the temperature reached its lowest point; the decrease averaged 2° to 3° F., and once amounted to 6° F. The average duration of the low temperature was about fifteen hours. The pulse was always diminished with the temperature, but not in regular proportion. The respiration was somewhat decreased. The drug caused restlessness, paleness, more or less sweat, and occasionally symptoms of collapse. Sometimes there was nausea, no vomiting. The stools were greenish-brown or bright-green. The urine was increased, was of dirty brownish color and contained hydroquinone. Sixteen other cases of typhus follow, in all of which the hydroquinone seemed to have a favorable action, similar in general to that described in the first case. In several cases of scarlatina the drug appeared to have much more action upon the pulse, without causing any cardiac weakness, so that its use is especially advantageous in this fever. In acute pulmonary affections the drug also proved of use. In overlooking all the cases in which the drug has been tried, we find: that its average effect in regard to the temperature is to

lower it $2\frac{1}{2}^{\circ}$ F. Like all other antipyretics, it occasionally has no immediate effect, but this is then gained by repeated doses. The lowering of the temperature took place quite rapidly in from one to three hours, its subsequent rise being delayed from ten to twenty hours. Its action upon the pulse varied greatly in different diseases. Its characteristic action, therefore, may be called antipyretic. To small children 0.3-0.5, to larger ones 0.75-1.0 was given. When the temperature reached its high point the dose was repeated. As soon as the drug began to act, the children became restless; the smaller they were the more frequently occurred slight twitchings, which, however, soon disappeared. Very soon more or less sweat appeared over the whole body, the more profuse the older the child. In rare cases vomiting occurred, usually not immediately, but in from one-half to one hour after the drug was given. When this is repeated, it is best to give the drug per rectum in larger doses than per os. With the vomiting occur symptoms of collapse. Patients become pale, often livid and apathetic. The respiration becomes labored. In such cases, especially in typhus, we must not delay the use of active restoratives. Hydroquinone does not appear to cause or to increase diarrhoea. The urine shows its presence after even one dose, resembling in color that after carbolic acid intoxication. Its amount is sometimes increased. On stopping the drug, the urine after a few hours becomes normal. Unpleasant effects, such as occur in the use of salicylate of soda, dryness in the mouth and throat, singing in the ears and deafness, delirium, erythema, transudation into the subcutaneous tissue, etc., were not observed in the use of hydroquinone. The latter lowers the temperature more rapidly than salicylate of soda, but apparently in somewhat less decided manner. In order to increase its effect, Steffen is about to make careful experiments with larger doses. He cautions, however, against beginning with anything but small doses. The duration of the lowering of the temperature is less than with salicylate of soda. From all his observations, Steffen concludes that hydroquinone, when carefully used, is a reliable antipyretic without evil accompanying effects. Further experiments, of course, are necessary to determine its proper standing.

J. F., JR.

15. Demme: Pilocarpine in Diphtheria (*Jahrbch. f. Kindhklde.*, XVIII. B., 1 H.).—PROF. DEMME has been universally recognized as the advocate and staunch supporter of the use of pilocarpine in diphtheria, but being called to task by Dr. Guttman as one who recklessly claimed that the remedy was an absolute specific, he defends himself as follows. His admissions are interesting to those of us who have failed in the use of the drug. Demme says that Guttman's statement is in direct contradiction to the opinions which he has expressed in his publications. In his first article in 1877, he claimed that under the use of pilocarpine there was a rapid spontaneous loosening of the diphtheritic deposit. His next article, published in 1881, after a long series of experiments, entirely confirmed this statement, but contained the following words: "The momentary symptomatic result, the diaphoretic and expectorant action of the pilocarpine was in some of these cases very satisfactory, and yet, at the same time, the pernicious general infection of the blood made rapid advance even to final paralysis of the nerve-centres. I confess here openly, that even to-day with pilocarpine in my hand, I feel myself completely powerless before such pernicious overwhelmingly intoxicating cases of scar-

latinal throat necrosis and general diphtheria." In the close of the same article, after describing the extremely favorable action of the pilocarpine in loosening the diphtheritic deposit, occur these words: "I am not able to ascribe to pilocarpine any specific action on the diphtheritic virus." In a still later article, he says that "his most recent experiments offer no stand-point for attributing to pilocarpine a specific action on the diphtheritic virus." He now says that, in a considerable number of cases of local diphtheritic process, in spite of early and systematic internal use of pilocarpine, the disease spread wider, so that, just as in the severe pernicious cases of diphtheria, which offer the best standard for judging of the specific action of a medicament, the drug, so far as the final result of the disease was concerned, proved just as valueless as all other remedies tried up to the present time. Demme considers that these statements contradict Guttman, and are in accordance with his former publications. He has always recognized in the drug no specific, but only a limited symptomatic action. He proposes soon to publish more statistics upon the subject.

In this connection, two abstracts, published in the *American Journal of Medical Sciences* for April of this year, are of such interest that I insert them almost entire. The first is from the *London Medical Record* of December, 1881, and contains the substance of Demme's long article in Vol. XVI. of the *Jahrbuch*. His conclusions were as follows: 1. The variable results in the observed action of muriate of pilocarpine are due to the presence with it of a second alkaloid, jaborin, resembling atropia, as the pilocarpine is more like nicotia. 2. When a rapid effect is wanted, it is best given hypodermically in doses of one-sixtieth to one-twenty-fourth of a grain under a year old, and one-twelfth grain up to ten years. Internally, the dose should be two or three times larger, with gum acacia to prevent diarrhea. 3. To prevent the vomiting and collapse, cognac, wine, strong tea or coffee, or ether, hypodermically, may be previously given. 4. Different individuals, and the same individual at different times, vary in susceptibility to the action of the drug. 5. As a part of the general activity of the secretions, a marked expectorant effect occurs. Less constantly there is increased urinary secretion with the diaphoresis. 6. The superficial erythema is caused by irritation of the peripheral vessels. 7. In scarlet-fever, where the rash is delayed or incomplete, and severe cerebral symptoms attend, an energetic diaphoresis by injection of pilocarpine most rapidly removes the scarlatinal poison from the blood, and brings out the eruption, thus relieving the cerebral symptoms. 8. Pilocarpine cannot prevent scarlatinal nephritis, but is the most effectual remedy against dropsy, and under its use the kidney affection appears to run a more favorable course. 9. Nor can it prevent uremia, occurring from extensive glomerular and interstitial nephritis, but in less severe cases, it can avert uremic attacks threatening life, and relieve them more quickly than any other remedy. 10. Its expectorant action facilitates recovery from catarrhal laryngitis, infectious and none infectious croup, and catarrhal pneumonia. Similarly, a quicker loosening of the membrane and fibrinous infiltration of true and also of scarlatinal diphtheria follows the administration of pilocarpine, though it does not appear to exert any action upon the *specific contagion of the disease*.

The other article is from the *Lancet* of December, 1881, and is a resumé of the subject.

During the past year, extensive trial has been made, on the continent more than in England, of pilocarpine in diphtheria. The use of such a depressing agent, where there is a marked tendency to asthenia, may seem hazardous, but it has been given for its local influence, to aid, by augmenting the buccal secretions, in the separation and detachment of the false membranes. The method originated with Dr. Guttman, who, in October, 1880, published the results obtained in eighty-one cases. Of these, fifteen were, in his opinion, so severe that they would probably have died under any other treatment, and thirty others were of moderate severity. *All recovered.* The abundant and continued salivation detached the membranes, removed the infiltration, and in most cases the pharynx recovered its normal aspect in from one to three days. Results so startling in a disease so grave awakened universal interest, and M. Picot (*Swiss Revue Médicale*) has collected observations from numerous investigators. A comparison of these facts with some recorded elsewhere does not, it must be confessed, afford much support to the alleged value of the method of treatment. The total number of reported cases in which it has been tried is one hundred and twenty-nine, of which no less than forty-seven died, a mortality of about 36.5%. At the same time, the impression conveyed by massed statistics is apt to be misleading on such a subject. It is clear that in a considerable number of the fatal cases, the treatment was commenced too late for life to be saved by any means. Some patients were already collapsed, in whom death would be rather hastened than hindered by the action of pilocarpine. In others, the treatment followed tracheotomy, and therefore can hardly have had a fair trial.

The results obtained by different observers varied in some instances so much that they can be accounted for only by assuming a difference in epidemic severity. Lax, for instance, treated ten children. The condition of six was grave, and that of two was desperate, but they all recovered, the false membrane coming away freely, in the abundant mucus and saliva. On the other hand, Alfoeri tried pilocarpine in six cases, all of which proved fatal. Several investigators have concluded that it is more serviceable in adults than in children, and in pharyngeal than in primary laryngeal diphtheria. In Neumeister's cases, all the adults (4) recovered rapidly, but one-half of the children died. He discountenances its use in children. Of those treated by Delico, all in which the diphtheria was limited to the pharynx recovered, though several were most severe, while of those primarily laryngeal, one-half died. In one child, aged eleven, recorded by Lereboullet, pilocarpine obviated the necessity of tracheotomy.

It may reasonably be asked whether an agent so powerful is not likely to be injurious if it fail to do good. Opinions differ on this point. Guttman and Kuster found no prejudicial influence in any case, but Archambault, who lost every severe case thus treated, observed the sweating to be followed by extreme nervous depression. Alfoeri attributed to it a pulmonary edema which proved fatal in one case. Weise lost three cases from collapse soon after commencing the treatment, and Neumeister attributed to it extreme feebleness or sudden irregularity of the pulse which he observed in six cases. These opinions are not reassuring,

though some of the symptoms may have been due to the disease, and not to the remedy.

The drug has been given by the mouth, skin, and rectum. Guttman gave it by the mouth, the average dose being one-fiftieth grain for a child, and one-twentieth grain for an adult, given with a little pepsin and dilute muriatic acid, followed by a small quantity of Hungarian wine. He urges most strongly the importance of regular administration. The interruption of the treatment by sleep was always succeeded by an increase in the local symptoms.

Some investigators have not followed Guttman's method rigorously. The doses given by Archambault were considerably larger. By some, hypodermic injections have been employed with success, while Lepidi Chioti produced salivation in ten or fifteen minutes by enemata containing one-half grain.

The conclusion from this survey of the facts is certainly disappointing to the expectations raised by Guttman's original results, which become the more remarkable, and even mysterious. But the facts at present ascertained are insufficient to decide the influence of pilocarpine in diphtheria, and further observations are necessary in cases in which the agent is employed sufficiently early to afford it a fair scope.

J. F., JR.

16. Kaposi: Bromine Acne from Mother's Milk (*Jahrbuch f. K.*).—PROF. KAPOSI reports the case of a child which is interesting, not only from a practical clinical stand-point, but deserves consideration from its general pathological teaching.

The patient, nine months old, a girl, was brought to his clinic with an eruption which the mother said had begun fourteen days before, and which was spreading still. On the cheeks was a tuberculo-pustular eruption, which was immediately recognized as a severe form of bromine acne. To the question when and how much bromide of potash the child had taken, the mother answered that the child had taken none, but she herself had taken it. She still nursed the child. Here then was a case where a *suckling was diseased with a most intense bromine acne, caused by the presence of the bromine salt in the mother's milk*. The mother had not taken the drug for two weeks, but it was at that time the child's trouble began, and it had increased since. The mother had no sign of the eruption herself. Kaposi adds a few words about treatment. Almost any method may be used, and provided the bromine is removed from the system, or in other words, no more is taken into the system, the eruption will get well. But the large pustules, the tubercles, the ulcerating points, all leave scars behind them. To avoid this, K.'s claims is the decided indication for treatment, and this he says he does by the use of a well-adhering emplastrum hydrargyri. In very small children, to prevent salivation, this may be modified by making it a plaster of equal parts of emplastrum hydrargyri and empl. saponat.

J. F., JR.

17. Report of the Children's Hospitals of Europe for 1880 (*Jahrbch. f. Kindhikde.*, XVIII. B., 1 H.).—From the published reports of the principal children's hospitals under German control, I have prepared the following table, containing points of interest to all concerned in the management of such institutions here.

Name of the Hospital.	City.	Whole number treated.	Boys.	Girls.	Cured.	Improved.	Unimproved.	Died.	Died in 24 hrs.	Remaining.	Age.			Diphtheria.					Average No. of days of treatment.	Cost per day in cents.	Whole No. of days of treatment.	
											0-4.	4-8.	8-14.	Cured.	Died.	Tracheotomized.	Cured.	Died.				
St. Annen.....	Vienna.....	1039	519	520	686	73	26	219	55	40	300	35	330	189	24	11	13			24	48	16,499
St. Josefs.....	Vienna.....	684	360	324	423	18	12	185	24	46	292	298	181	33	37	1				19	47	
Leopoldstaedter.....	Vienna.....	790	401	386	533	84		110	23	43	293	292	205	66	35	13	3	10				
Kronprinz Rudolf.....	Vienna.....	358	184	174	222	33	12	61	6	20	132	112	78	35	21	57	21	36			50	8,544
Caroline.....	Vienna.....	102	47	55	54	22	6	11		9						2	1	1				8,364
Kaiser Franz-Josef.....	Prague.....	990	515	483	491	99	49	307	22	44	302	377	311	11	25	26	17	9			50	19,004
St. Ludwig.....	Krakau.....	757	386	371	351	56	51	241	25	55	266	281	210	18	18	7	3	4			31	
Charity (Armen.).....	Buda-Pest.....	727	362	365	606			76	3	45	193	262	272	5	6	2					31	15,338
Charité.....	Berlin.....	1046	552	494	419		25	554		48	668	132	246	11	38							
Kindereheil Anstalt.....	Stettin.....	315	166	149	296	23	8	48	5	30	80	102	133	5	2	5	1	4			37	33
Kindereheil Anstalt.....	Dresden.....	343	200	143	155	53	33	75		27	166	95	82	42	29	27	4	23			40	43
Wilhelm-Augusta.....	Breslau.....	350	153	197	258	50		31		11	95	75	150	6	2	1	1	13			25	
Dr. Christ's.....	Frankfort.....	171	107	64	100		14	34		23	80	21	67	18	7	8	3	5			43	
Kinderspital.....	Zurich.....	198	101	97	97	31	16	51		16	104	49	42	22	27	32	9	23			44	56
Kinderspital.....	Basle.....	416	216	200	296	26	12	46		36	205	140	71	58	15	19	8	11			35	61
Jenner'sches.....	Bern.....	204	130	74	135	17	6	20		26	160		44	2	1						43	
Prinz Peter v. Oldenburg, 1879.....	St. Petersburg.....	1779	845	934	1011	223	63	282	44	165	571	607	601	72	51	34	8	26			37	
Prinz Peter v. Oldenburg, 1880.....	St. Petersburg.....	1921	927	994	1249	205	41	291	36	132	560	600	760	87	69	50	10	40			31	
Dr. Pokrowsky's.....	Moscow.....	975	540	435	775			117	26	83	134	231	610	23	7							
St. Vladimir.....	Moscow.....	1585	831	704	880	277		214	23	161	357	387	635	38	12	5	7				42	

From this table, which omits a few of the smaller institutions, it may be interesting to glean a few statistical points. We have here represented seventeen children's hospitals. This includes none of the Parisian or London hospitals, none of the Italian, Spanish, Turkish, and only part of the German; Leipzig, Hannover, and other large cities being entirely omitted. And yet with even this scanty enumeration, we find that 14,760 children were treated during 1880, and each year there is an increase. Of these, 7,597 were boys, 7,163 were girls, a pretty even division. 8,997 were discharged cured, 2,979 died. This is an average percentage of about 28.3 per cent. The lowest death-rate was in the Wilhelm-Augusta hospital, in Breslau (9.1 per cent), and the highest in the Charité, in Berlin (55.5 per cent). The latter is explained by the fact that more than half the children in the latter institution were admitted under one year of age. 1,045 cases of diphtheria were treated, of which 541, or a little over one-half, were cured. In some hospitals, the percentage was much more favorable than this. Of the tracheotomies, about 30 per cent were successful. The average daily cost per child, as stated for twelve only of the hospitals, was 46 cents. The lowest was 25 cents.

The methods of keeping the reports should commend itself to us all. Nothing makes a hospital so valuable in a scientific view as accurate, full, and systematic reports.

J. F., JR.

8. Newman: Vaccination and Cow-pox Inoculation (*Lancet*, August).—DR. THOMAS NEWMAN asks: "Is the rapid spread of our old enemy, the small-pox, due to want of vaccination, imperfect vaccination, or imperfect isolation?"

The want or absence of vaccination is seen mostly in crowded cities, where opportunities for evasion are great. Of imperfect vaccination, the author says that "to assert that this is a fertile source of the spread of small-pox is only to state a truism." As causes of imperfection he mentions obstinacy of parents, abstraction of lymph from the punctures by suction or other means, mistakes as to the age of lymph inserted, weakening of lymph by overstraining the source of supply, and the acceptance of vesicles which are neither true nor sufficient in their protective character. Inspection of the scars in later years often shows the force of these last-mentioned causes. Dr. Newman frequently finds one, two, or three scars on a person which he does not regard as characteristic, and in such cases he can always get perfect results from vaccination with good lymph. The imperfection of vaccination is a great support to the opponents of the practice. Whatever may be said by them, however, one indubitable fact remains—that vaccination engenders confidence in the public mind, and great security is felt in its beneficent influence.

Isolation, Dr. Newman thinks, is scarcely ever perfect. The best is when the patient is surrounded by a cordon of vaccinated persons. His remarks in regard to cow-pox do not very strictly apply here. Natural cow-pox he believes is very rare. Another form of eruption in the cow has been formerly mistaken for it, but though the lymph from this makes acute sores when inoculated in the human being, yet it is not protective; and even while the sores exist, vaccination with good human virus will *take*, and the other sores heal and leave the vaccination pustule. The force of the article is rather in favor of human virus, though it does not discuss the carefully prepared bovine virus so generally used here.

J. F., JR.

9. Voight: Diphtheria and Tracheotomy (*Jahrbch. f. Kindhklde.*, XVIII. Bd., 2 H.)—DR. VOIGHT reports from Strassburg forty-seven cases of tracheotomy performed for diphtheria and croup. Of these, ten were cured—21.27 per cent. The sexes were about equally represented. Two children were under one year of age, fifteen were between one and two, and the rest over two years. The first point of importance is the mortality in the early years. The two children under one year died, of the fifteen between one and two years only one was saved, of eight between two and three years only one was saved, while there were eight successful cases out of the remaining twenty-two. Voight spends some time in discussing the identity of croup and diphtheria and concludes that, while there may be a clear pathologico-anatomical distinction between the thick fibrinous deposits upon the membrane in croup, and its intense infiltration in diphtheria, yet clinically this differentiation could not be carried out.

The reports of nine other operators give an average of thirty-one per cent of cures. Voight therefore feels called upon to explain his lower percentage. His first point is that many of the children were brought almost moribund to the hospital, and in most cases were from the very lowest classes, poorly nourished and rachitic, and had either been through a series of diseases, or, his second point, they contracted complications in the hospital. The provisions for isolating were totally insufficient, and case after case was complicated with other infectious diseases. Almost all who died had complicating scarlatina, measles, pertussis, or typhus. Even of the ten who recovered two had measles after the operation, two had scarlatina, and one had typhus. The author described the bad arrangement of the rooms and the effect of the various complications. The chances are poorer when diphtheria follows another disease than when some other disease follows the diphtheria. It is interesting to note that disinfection of the wards by all the most approved and newest methods seemed to have almost no influence upon the spread of the diseases. A third reason given for his low percentage of cures is that the epidemic was a severe one. A fourth was that all kinds of cases were operated on. Voight quotes König's opinion on this point: "A surgeon is not only justified, but is in duty bound to help a patient suffocating from diphtheritic stenosis, so long as it is in his power. The fact that the patient may perhaps afterward die from the malignancy of the disease should no more prevent him from doing his duty and, by opening the trachea, overcoming the momentary constriction than the almost certainly approaching fatal result in a case of pyemia should prevent his tying an artery in case of a severe hemorrhage in the course of the case. I do not hesitate to say that a surgeon who omits to propose operation is guilty of neglect." König's opinion is strong, but the general feeling in Germany is that the operation should always be done, if only for euthanasia. The author describes his method of operation in full. Chloroform was generally used. The thyroid was carefully lifted up from the trachea. The canula was afterward covered by a compress soaked in camphor-wine and changed twice a day. All sorts of methods were tried to prevent diphtheritic infection of the wound, but in severe cases none were successful. Chloride of zinc and salicylic acid seemed to do as well as anything. The canula was very frequently changed and washed with carbolic acid. In some cases a solution of salicylic acid was dropped into the trachea, but it ap-

parently did no good. The principal after-treatment was by inhalations. Large steam apparatus was kept constantly going in the room and direct inhalations given in addition. After enumerating all the substances used for inhalation, the author says "we have become convinced, after thorough trial of all these, that glycerin is the best fluid for inhalation after tracheotomy." A little thymol may be added if desired. Voight claims great results from this both after tracheotomy and in stenosis before the operation. They now use it exclusively at Strassburg. Most of the new remedies for diphtheria have been tried, especially pilocarpine, but the general treatment now is purely symptomatic and consists of ice-cravat, gargles, sprays, and full nourishment and wine. Before detailing his cases in full Voight describes the *immediate* result of the operation. This was in every case "eclatant." Euthanasia was complete in even the worst cases. He believes there is very little chance in operating on children under two years.

On examining the detailed account of the forty-seven cases, we find that of the ten successful ones two ran their course without complication and were cured in two weeks. Two were attacked three days after the operation by scarlatina. Two had measles and broncho-pneumonia during their convalescence. One patient had to be operated upon twice. Without taking time to study the cases more fully, we can agree most heartily with the author's closing plea, which is for children's hospitals with sufficient accommodations for complete isolation of patients. The only children's hospital in Europe where the demands of hygiene are thoroughly complied with is the St. Wladimir hospital in Moscow. This has seven buildings for isolation. These are separated from the main building by a fir grove, and are about twenty-five to one hundred metres apart. In England there are a few good pavilion hospitals for children, and in Germany some are now being constructed, while Paris is still behind the age in this respect. How is it in New York and the large cities of this country? Have our children's hospitals proper facilities for isolating infectious cases?

J. F., JR.

20. Fuerst: Acute Rachitis (*Jahrbch. f. Kindkldk.*, XVIII. B., 2 u. 3 H.)—DR. L. FÜRST discusses the question of the existence of "*acute rachitis*" in an article which will surely awaken interest in Europe where rachitis is so common. In our country, thanks to the better condition of the lower classes, we see but few cases of this disease of malnutrition. Yet, it is interesting to see what is the general opinion of the European pediatricians on so important a question. Fürst takes up one by one all the cases which have been reported as bearing on the subject, analyzes them, casts out some, places some in other categories, and then puts alongside of them the written opinions of those most experienced in the study of the disease. Stiebel, with his rich material for study, is the strongest advocate of the theory that acute and chronic rachitis are "essentially different diseases," while Hennoch, after observation of thousands of cases of the chronic form, denies totally the existence of an acute form, or even an acute stage.

Stiebel even goes so far as to divide his acute rachitis into three stages. These are:

1. Stadium of Kakotrophy.—Begins with digestive disturbances (vomiting, diarrhea, distended abdomen). There is thirst, frequent pulse (140

or over), frequent respiration. The urine is acid and sometimes albuminous. Phosphate of lime is found in the stools. Sweats increase, and the child takes on a senile appearance. It then, in from four weeks to five months, dies of exhaustion and anemia, or the fever and the sweating gradually decrease, the nutrition is bettered, the diarrhea and urinary symptoms disappear. There often is left some curvature of the bones, or this may come on later.

2. Stadium of Muscular Atrophy.—The child lies still, its feet stretched out stiff and immovable. Every turn makes it cry, and the lightest touch causes pain. If there is rachitis of the thorax, the lightest pressure of the coverings may cause pain. The skin is wrinkled in consequence of the emaciation. The extremities are stunted, but do not become crooked until the child begins to walk.

3. Stadium of the Bone Affection.—The true *rachitic stadium*, which Stiebel calls the "final result of a general disease," begins with swelling of the epiphyses, bendings and crookings at the diaphyses. Gradually the swellings decrease, the desire to move the limbs returns, and the child recovers but with crooked bones.

In such a picture of acute rachitis as this, Stiebel stands almost alone; the others, however, giving him credit for clearly stating what may be the acute stage of a general or chronic rachitis. The other extreme would perhaps be represented by Hennoch's declaration, that there is *no rise of fever and never any pain* in rachitis. Perhaps the following schedule will show about how opinions stand.

1. The acceptance of acute rachitis, as a disease in itself, of constitutional form (Möller, Stiebel).

2. The acceptance of the acute process as the initial stadium of rachitis (Möller's later opinion, Jenner, Ritter von Rittershain, Förster, Rehn).

3. The idea that it is an intense, acute, and general form of the usually local rachitis (Senator).

4. The view that the symptoms depend on a greatly increased growth of bone (Bohne), or on congenital syphilis (Petrone), or on inflammation of the bones (Oppenheimer).

5. Complete denial as to any acute stage or form (Hennoch).

The author then reports in full a case which would seem, more clearly than any of the others mentioned, to show that there certainly is an acute stage to rachitis, if not an acute form. It seems on reading it that he does not claim as much for it as he might, for his final conclusion is rather weak. He decides to deny the existence of an *acute rachitis*, and holds it more correct to speak of "an acute initial stadium in certain cases of rachitis, in which, in addition to violent symptoms of growth of the skeleton, there are inflammatory painful swellings of the soft parts, more or less fever, gastric derangement, and disturbance of nutrition." In this way we may separate those cases in which these violent symptoms mask a rachitis which afterward is fully developed, from the cases of bone-growth and bone-inflammation, which are not really of rachitic form, and should not be classed with this disease. Such a definition he (Fürst) thinks is much less likely to lead to error than the adoption of the term "acute rachitis."

J. F., JR.

21. De Toma and Alvaro: Examination of the Blood and Pustules after Vaccination (*Italia Med.*, 27).—DE TOMA and ALVARO declare after a long series of examinations:

1. In healthy, unvaccinated men there is no trace of any micro-organism in the blood.

2. In vaccinated persons, at the time of the pustule formation, the same micro-organism is found in the blood as in the serum of the vaccinia pustules.

3. In the fever stadium, *i. e.*, at the height of the pustule formation, these organisms are found in rich quantities in the blood, and are here, as in the pustules, in the process of division and increase.

4. During the stage of drying and retrogression, they diminish or disappear entirely.

5. Vaccination with the blood of a vaccinated calf gave a positive result in three out of sixty cases, and here also the organisms were found in the blood.

These micro-organisms withstand caustic solutions of potash and acetic acid, and show activity even when kept a long time. They are also found in variola patients, at first in only small quantity, but at the height of the disease they increase enormously in the blood, only to again decrease, and finally disappear during the stage of desquamation or drying up. They are also found in the air in the neighborhood of variola patients, and in especial abundance in the expirations. J. F., JR.

22. Fratkin: Anatomical Changes of the Skin during the Development of the Vaccine Pustule (*Inaug. Dissertation*, St. Petersburg).—

DR. FRATKIN, in making continuous microscopical examinations in the advancing stages of the vaccine pustules, has confined his study, at present, to the changes in the tissues, and left for later examination the fungus organisms. His material was partly calves and partly infants who died shortly after vaccination in the St. Petersburg foundling asylum. The first examinations in the calves were made twelve hours after vaccination; in the infants, none were made earlier than the fourth day.

In calves, even twelve hours after the vaccination, there was a cloudy swelling of the cells of the rete Malpighii, and cellular infiltration of the corium. On the second and third day, this enlargement and swelling of the cells was increased, and there were found in them vacuoles filled with serous fluid, and which by confluence, formed larger spaces in the middle layer of the rete. At the same time, in the neighborhood of the puncture, there were seen in the cell protoplasm small bright bodies which reacted with chemical agents just as the "diphtheroid" cells observed by Weigert in variola pustules. After four or five days, still more of these bodies are found, there are more and larger spaces, and in these are occasional white blood-corpuscles. In the central part of the pustule, there is suppuration even as early as this, and by the sixth or seventh day, it extends to the periphery. Throughout the whole time, the changes in the corium are more extended than those in the epithelium.

The development of the pustule in children is completely analogous to this, but proceeds more slowly. It does not seem to be influenced by the method of vaccination or the kind of lymph used (human or bovine). Yet in some details, the pustule in children differs from that of the calf. First, the cellular infiltration of the corium is less extended and intense. Second, the spaces filled with serous fluid are much larger, and third, not only diphtheroid bodies, but diphtheroid cells are found, occurring first

in the centre, and then gradually spreading toward the periphery. Fratkín names these cells "diphtheroid," after Weigert, though not sharing his opinion of their nature.

The umbilication of the pustule, he claims, depends on the fact that the cells of the rete Malpighii, which are immediately touched by the virus, rapidly, by granular or diphtheroid degeneration, die off and dry up, while the more distant parts, under the irritating influence of the contagium as it advances to them, at first absorb fluid, and become changed into smaller or larger spaces, which raise the epithelial layers in the periphery. As the degeneration and drying of the centre extends, the umbilicus becomes larger. Fratkín is convinced, by experiment, that the umbilication in pustules produced by artificial means (as by vaccine-salves, caustic potash, etc.) is produced in identically the same manner.

J. F., JR.

23. Karrik: The Best Method of Preventing Variola Scars (*Wratsch*, 12. 1881).—DR. G. KARRIK, after discussing the various means recommended for this purpose, comes to the conclusion that two factors are necessary for success. These are: First, comparison of the pustules from without, by means of an elastic material; and second, exclusion of light and air. All these requisites are best supplied by the method of Smarth, of Edinburgh—frequent painting with a thick solution of rubber in chloroform. The chloroform rapidly evaporates, and leaves a firm, adherent layer of elastic rubber which, after repeated paintings, becomes black and non-transparent. The painting should be begun as soon as the eruption appears, and continued till the crusts on other parts of the body fall off. The best way to prepare the solution is to shake the finely-cut native gum in chloroform. The best material should be used, as otherwise, after the evaporation of the chloroform, it will not be elastic enough.

The author narrates thirteen cases in which he has had marked success with this method. Another advantage of it is that it almost entirely does away with the violent itching which accompanies the eruption.

J. F., JR.

24. Mueller: A Rare Case of Hernia Cerebri (*Jahrbuch abstracts*).—DR. N. MÜLLER (Moscow) relates a case of the above which was remarkable both for the size of the tumor and the length of time the child lived. The tumor was in a well-nourished new-born babe, and was as large as a child's head. It occupied the anterior part of the skull, from the nose to the anterior border of the greater fontanelle. Its movements were rhythmic and isochronous with pulse and respiration. It was enlarged by the child's crying, decreased on pressure, was translucent and of like consistence all over, with the exception of a part about as large as an apple, which covered the nose, seemed to form a sort of appendix, was much harder than the rest, and did not become smaller on pressure. The skin covering it was atrophic and hairless. Firm lateral pressure discovered a defect in the bone on the bridge of the nose. The skull was dolichocephalic and asymmetric, the fontanelles widened and pulsating.

During the whole period of observation, there were no signs of paralysis or disturbances of the senses evident. The child slept a good deal, and even in the second half-year was apathetic, in short, idiotic. The bodily development was also very slow, and at the end of the tenth month there were still no teeth. The tumor for a long time grew very

gradually, but at the beginning of the tenth month the increase became more rapid and the tension greater. It was now as large as an ostrich egg, larger than the head. Toward the end of the tenth month, irregular febrile movements began, and at the beginning of the eleventh month, the child had a convulsion lasting some hours. Some days later, the skin sloughed, the tumor "broke," about 2,000 cc. of bloody serous fluid was evacuated, and the sac, except the appendix, fell together. The quiet caused by this was of short duration, for the opening healed, the sac filled and again broke, and discharged about 500 cc. of fluid, which now had some pus in it. This was repeated twice more, the fluid becoming almost entirely purulent. No more convulsions occurred, but vomiting and somnolence were observed before each discharge. After the fourth time of opening, the child collapsed and died. It was then eleven and one-half months old.

The autopsy showed that the sac communicated with the cavity of the skull through a heart-shaped opening about $3\frac{1}{2}$ cm. in diameter. The appendix was a separate cyst. The larger sac contained, in addition to fluid, a hernia of the cerebral substance about as large as a hen's egg, which was formed of the anterior lobes grown together, and which contained cavities communicating with the lateral ventricles.

In connection with this case, Dr. Müller reports the number of cases of hernia cerebri which have occurred in the Moscow Foundling Asylum in the last ten years. There were in all 42 cases, that is, 1 case to 3,000 children. There were 24 boys and 18 girls. The size of the herniæ varied from that of a hazel-nut to a child's head. In contradiction to the statements of Bednar, Vogel, and others, hernia cerebri fronto-nasalis occurred more frequently (34 times) than hernia cerebri occipitalis (8 times). Hydrocephalocele occurred 20 times, encephalocele 17 times, and hydromeningocele 5 times, the latter mostly 4 times) in hernia cerebri posterior. The skulls showed abnormalities of shape in about half the cases. In 9 cases there were still other anomalies of development, monophthalmos, palat. fissum, etc. The nutrition of the children was, contrary to general opinion, in most cases good. Only 4 were cases of premature birth or bad development. Twenty-six of the children did not live one month, 13 died between one month and one year, 3 with very small herniæ were sent to the country and lost sight of. The autopsies always showed a more or less severe hydroceph. ventric., which, in ten cases, was the cause of death.

J. F., JR.

25. Rupprecht: Congenital Spasmodic Rigidity of the Limbs (*Volkmann's Klin. Vorträge*, 198).—DR. PAUL RUPPRECHT prefers Little's term "congenital spastic rigidity of the limbs" to the name used by Erb, "spastic spinal paralysis." He narrates in detail ten very interesting cases; which we, however, must omit. In all of them, the characteristic symptoms were the presence of tonic spasm in numerous symmetric groups of muscles, most marked in voluntary motions, but seen also in passive motions, in connection with which even the whole body may be thrown into tetanic rigidity, while, on the other hand, when the attention is otherwise directed, and the patient resting quietly upon the back, both active and passive motions are undisturbed. The muscles of the lower extremities are most affected, especially the abductors and muscles of the calf. The spastic contraction of the muscles of the calf caused

club-foot position at each attempt to walk. There was no trace of paresis or paralysis, but secondarily slight atrophy from want of action. In most cases, there is also spasm of the muscles of the eyes; in some, of the face and throat. In most cases there was no disturbance of the intelligence, but only a spasmodic difficulty of action in the muscular apparatus through which the intelligence especially makes itself known. Very often the patients were prematurely born or the labor had been very difficult.

The surgical orthopedic treatment helped a great deal in many cases, especially when the patients could already walk upon their club-feet, when the contractions were limited principally to the muscles of the calves and to the adductors, and when no deformities of the bones had yet developed. It was necessary to continue the treatment for years. Relapses must be watched for after tenotomy. Dr. R. is of the opinion that nerve-stretching may be of great avail in these cases.

R. then reproduces from the literature of the subject the various opinions of authors upon the disease. He begins with Delpech, who described it as early as 1828 in his "Orthomorphie." In 1853, Little gave a masterly description of it in his "Deformities of the Human Frame." Again, in 1862 in the Transactions of the Obstetrical Society, and 1870, in Holmes' "System of Surgery." He noted sharply the causal connection of this disease with asphyxia and apoplexia neonatorum, and substantiated his points by the results of autopsies. Little is said to have made over 200 striking observations bearing upon the point. In Germany, Stromeier first described the disease, which he had learned from Little to recognize, in 1864, and named it "permanent tetanus of children." Busche described it more fully, in 1864, in his work on surgery, and Benedikt mentioned it under the name hemi- and paraplegia spastica infantilis, and attributed it to a cerebritis with consequent atrophy, without, however, being able to prove this statement. It is only lately that Erb (1875) has characterized the disease more closely as spastic spinal paralysis, and suggested that it is dependent upon primary sclerosis of the lateral columns of the cord, admitting, however, that this is only an hypothesis, while later he seems to think that congenital abnormalities of development may be its cause. Seeligmüller (*Jahrb.*, 1878) gave six observations which seemed to support Erb's opinion. In 1879, Erb collected the results of all reported autopsies upon adults, and then formulated a new opinion, as follows: The symptomatic picture of spastic spinal paralysis occurs in those cases in which there is established a gradually developing disease of the pyramidal columns in any portion of their course, possibly even in the brain. We can, therefore, now consider that the symptom of spastic contraction may complicate numerous diseases of the central nervous organs, and that in each individual case it will remain to be determined of what particular kind the causal lesion is. The congenital form of the disease, however, will always have its particular type.

The prognosis of this congenital form was well known even to Delpech. It is never completely cured, but may be so much improved that, as in one case of Dr. Rupprecht, a patient who was ripe for the lunatic asylum became a scholar in a gymnasium. Little also stated that surprisingly good results could be obtained by rational therapeutics and great patience.

J. F., JR.

26. Remak: Pathology and Therapeutics of Localized Muscular Spasms (*Berl. Klin. W.*, 23).—DR. E. REMAK reports the case of a ten-year-old girl suffering from rhythmical convulsions, which began four weeks after a fall. These spasms were at first of such a nature that, when the child was placed upon its feet, it was tossed into the air as by a spring. They disappeared almost entirely under treatment by arsenic. Some months later there developed rhythmical twitchings of the muscles of the neck by which the head was jerked backward sixty times in the minute. During sleep there was rest. The treatment was by a weak galvanic current, the positive pole upon the muscles of the neck. After thirty-seven sittings there was great improvement; after about nine months complete cure. Remak classes the case as a spastic neurosis *sui generis*, probably arising from emotion and without anatomical basis. When this case was reported in the Berlin Medical Society, Henoch, who had also seen it, remarked that he had seen ten similar cases. They differed from chorea in that the movements were in no degree co-ordinated, but always took place backward. He, therefore, described the complex of symptoms with the name "chorea electrica." According to his experience the disease is very obstinate, yielding neither to bromine, strychnine, nor atropine. Two cases were cured by galvanism, but whether permanently is uncertain. Henoch noticed that, when the head of the child was fixed, nystagmus was frequently observed, and explains this by the circumstance that the roots of the accessorius in the upper spinal nerves on the one hand, and the nervus abducens and oculomotorius on the other hand, lie very close to one another, so that both may be easily affected by the same reflex irritation. The process has nothing in common with the spasmus nutans.

J. F., JR.

27. Langenbuch: Experiences in Nerve-Stretching (*Berl. Klin. W.*, 27).—DR. CARL LANGENBUCH reports at the close of his very remarkable work on the effects of nerve-stretching several cases where it was used in children, from which we select two.

1. This was in a fifteen-year-old girl who had suffered for seven years from weak and unsteady gait, and during the last two years had shown increasing contractions of the flexors of both arms and other severe symptoms, pointing to multiple sclerosis of both cord and brain. At first the n. ischiaticus d. was stretched. After only two days the speech was much better, the head was more firmly carried, the contractions decreased, the irregular motions of the legs partially disappeared, and the use of the crutches became unnecessary. One month later the left nerve was stretched, but the result of this is not yet reported.

2. In a four-year-old girl, with chronic pemphigus which had existed nine months, the right ischiaticus was stretched. The reason for this was the symmetric eruption of the vesicles in the cutaneous regions supplied by this nerve. Result: immediate disappearance and cure of all the bullæ. Death eight days later from diphtheria.

J. F., JR.

28. Demme: Thrombosis of the Vena Cava Inferior (*Jahrb.*).—PROF. DEMME found in a six-year-old boy, beside symptoms of a severe syphilis and marked infiltration in both lungs, a somewhat fatty liver and an advanced cachexia. Antisyphilitic treatment was begun on the 9th of October. By the 15th of December, the symptoms of syphilis had disappeared, the pulmonary infiltration had decreased, the bodily weight had

increased some two hundred and fifty gms., and the temperature was subnormal. On the 20th of December, there was new rise of fever, reappearance of the lung symptoms, and marked swelling of all the external lymph glands, with diarrhea and decrease of urine, and on the 15th of January, a tense filling and successive distention of the subcutaneous veins of the abdominal wall—*venæ epigastricæ par umbilicales* and *mammariæ*—was observed, together with marked meteorismus, edema of the lower extremities, icteric coloring of the conjunctiva, and albuminuria. Under the use of iodide of iron, the peripheral lymph glands and the pulmonary infiltration again diminished. The patient, who had become much emaciated, again in some four or five weeks gained some three thousand three hundred and fifty gms. The urine increased, the edema disappeared. There was, however, formed upon the abdominal wall a regular caput medusæ and a severe distention of the veins of the lower extremities. On the 22d of February, the child was discharged completely cured, except that the caput medusæ remained. We may understand that the thrombosis began in the vena cava inferior, and then extended to the *venæ iliacæ* and the veins of the lower extremities, while the *venæ hepat.* apparently remained free.

J. F. JR.

29. Monti : Arteritis Umbilicalis (*Arch. der Kind.*).—MONTI reports a case which supports the opinion of Runge that arteritis umbilicalis often causes pyemia. From this case and his other observations and experience, Monti would call the occurrence of pyemia in arteritis umbilicalis frequent. The diagnosis of arteritis cannot be made during life. The case was in a child four weeks old. The cord fell off on the fourth day. On the ninth day, the child became restless, had colic pains and meteorismus, lay with its knees drawn up upon its belly, cried from time to time, and occasionally vomited. The umbilical fold was normal until the end of the third week. From then on, the abdominal wall was strongly distended in the region of the bladder, and sensitive to touch. Monti saw the child at the end of the fourth week, and found slight icterus, temperature 38.5°, respiration 32, distention of the hypogastric region, with venous network over it, the spleen somewhat enlarged, the umbilical and ileo-cecal region not sensitive. In the hypogastric region was a round fluctuating tumor, the skin over which was edematous. Dulness extended from the umbilicus downward to the middle point of both Poupart's ligaments. Per rectum could be felt a tumor as large as a child's fist, and clearly fluctuating. The child became comatose, erysipelas appeared around the rectum, temperature rose to 39° C., and death occurred in three days. At the autopsy was found between the abdominal muscles and the peritoneum, a tumor as large as a child's fist, whose posterior and lateral surface was firmly adherent to the serous covering of the bladder. On the right, the abscess reached only to the horizontal ramus of the pubis, on the left, deep into the cavity of the pelvis. The umbilical arteries were thickened, and contained partly coagula, partly pus. The umbilical veins were normal. There was acute enlargement of the spleen and hydronephrosis.

J. F., JR.

30. Pinner : Diphtheritis and Tracheotomy (*Arch. der Kind.*, 2 Bd.).—DR. O. PINNER reports one hundred and thirty-five cases of diphtheria treated in the clinic of Professor Maas at Freiburg, between 1877 and 1880. There were four adults, sixty-eight boys, and sixty-three girls. The

mortality among the children was 55.4 per cent. Tracheotomy was done one hundred and one times, with thirty-three cures (32.7 per cent). The results of tracheotomy were found to vary greatly at different times, according to the character of the epidemics, and also according to the age, as may be seen from this table:

AGE.	TRACHEOTOMIZED.	DIED.
0- 1	3	3
1- 2	13	13
2- 4	39	27
4- 8	39	21
8-15	6	3

Most of the deaths occurred on or before the fourth day after operation. Deaths occurring later than this were mostly caused by complications.

The treatment of the diphtheria consisted in washing out the throat with antiseptic solutions and loosening the membrane with warm steam. Stenosis of the larynx was the indication for tracheotomy, and, unless the child was already asphyxiated, chloroform was always given. Tracheotomy *inferior* was always performed, and Pinner remarks that in regions where goitre prevails, the isthmus of the thyroid is, even in young children, so large that the *superior* operation can but rarely be done.

In the clinic at Freiburg, the steam pipes are so arranged that the steam, at a temperature of 25°-35° C., can be let directly into the room. Dr. P. warns against the use of emetics, saying that they bring nothing out of the air-passages, as the glottis is closed during the act of vomiting (Lüttich), while they do great harm by their depressing influence.

J. F., JR.

30. Szabo: Statistics on Pertussis (*Pest Med. Chir. Presse*, 35-45).—

DR. DIONYS SZABO reports some data on pertussis which are of interest, because of the large amount of material from which his facts are drawn. From 1875 to 1879, there were treated 4,181 cases of pertussis. These were of the following ages:

0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-
1,028	1,008	659	904	365	241	187	94	50	23	22.

According to months in the first year:

0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
12	71	70	61	62	104	95	97	100	109	76	171

Of the 4,181 patients, 1,812 were boys and 2,369 girls. In 248, there were constitutional diseases (syphilis, scrofula, rachitis); while 267 had had some weakening sickness. The number of cases increases gradually from January to July, and then decreases more rapidly than it increased, so that there are fewer cases in the months of November and December than in January. Pertussis occurs most rarely in the fall, more often in the winter and spring, and most frequently (36.17%) in summer.

Careful observation of the epidemics of scarlatina, measles, and pertussis, from 1855 to 1879, has convinced the author that each runs its own course independently of the others, though it does seem that pertussis appears more frequently after measles than after all the other infectious diseases.

The author noted the following complications—important because of

the large number of cases treated:—Edema of the brain (even hydrocephalus internus), 2; edema of the lungs, 2; general anasarca, 8; hemoptysis, 2; pulmonary emphysema, 8; subcutaneous emphysema, 1; ulcers of the frenum linguæ, 81 (2.57%); acute gastric catarrh, 120; umbilical hernia, 27; inguinal hernia, 11; prolapsus ani, 13; basilar meningitis, 4; eclampsia, 37; epilepsy, 4; temporal neuralgia, 1; hemiplegia, 1. Apoplexy, asphyxia, and spasm of the glottis may cause sudden death. In connection with the organs of respiration, there occurred—atelectasis, 3; croupous pneumonia, 8; catarrhal pneumonia, 146; catarrhal bronchitis, 260; capillary bronchitis, 269; pleurisy, 3.

Catarrhal and capillary bronchitis are more frequent the younger the children. Catarrhal pneumonia is most frequent between one and three years. The accidental complications are innumerable.

In Pest there were, from 1872 to 1874, 335 deaths, of which 224 were in the first year, 63 in the second, and 44 between the ages of three and five. In London, from 1844 to 1853, there were 9,260 deaths from pertussis—3,776 in the first year, 2,546 in the second, and 2,441 between two and five. More girls died than boys. In Pest, 1.5% of all deaths were from pertussis; in London, 3.4%. Nearly two-thirds of all the deaths from pertussis occurred between January and June. The mortality of pertussis varies in different places and in different epidemics between 2.7 and 7.8%.

J. F., JR.

32. Capitan and Charrin: Mumps (*Lancet*, August).—MM. CAPITAN and CHARRIN, having regard to the clinical evidence on which mumps is classed among the acute infective diseases, have searched for an organized virus in the secretions of patients suffering from the disease. In the blood of every case they found an abundance of minute organisms, for the most part spherical, but partly prolonged, and in the form of mobile rods. In the saliva, as is usual, there were large numbers of organisms, but most of these resembled those found in the blood. None could be discovered in the urine.

J. F., JR.

33. Logneau: Comparative Births and Death Rates (*Lancet*, April 15th, 1882).—DR. LOGNEAU presented an essay of singular interest to the French Academy of Sciences, on this subject. He has deduced from the statistics of different European countries, notably France and Prussia, the following remarkable facts. The rate of increase of population among Catholics, Protestant, and Jews, is in the ratio of one, two, three. He further finds that the number of illegitimate births among the Jews is very much smaller than among the other two classes. As it is well known, the mortality among illegitimate children is proportionately greater, this may in part account for the increase. A curious fact brought out by the essayist is, that while among Christian populations the proportionate birth-rate of boys and girls is about one hundred and five to one hundred; among the Jews, it ranges from one hundred and ten to one hundred and thirty males as compared to one hundred girls. This he assigns to the early marriages of the parents, who, as a rule, marry under twenty-five years of age. And, as has been well ascertained, early marriages give a greater proportion of male than female children.

J. F., JR.

THE AMERICAN
JOURNAL OF OBSTETRICS
AND
DISEASES OF WOMEN AND CHILDREN.

VOL. XV.] OCTOBER, 1882. [No. 4.

ORIGINAL COMMUNICATIONS.

OBSTETRICAL TETANUS AND TETANOID CONTRACTIONS.

BY

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WHEN, a short time ago, the case of tetanoid contractions which I shall report in treating of the diagnosis occurred in my service of the Maternity Hospital, I was much surprised to find that the first half-dozen books which I examined did not contain any information whatever on the subject. Still they were good books, special treatises on obstetrics or the puerperal diseases, standard works belonging to the literature of the four people which contribute most to the advance of science.¹ I began, therefore, a regular investigation and found indeed that there exist a few special articles on the subject of obstetric tetanus, or as it is more commonly called, puerperal tetanus, besides a rather limited number of isolated reports of cases.

I must use the term obstetrical tetanus, which incidentally

¹ Nothing on the subject is to be found in Barker's Puerperal Diseases, Winckel's Wochenbettskrankheiten, Lusk's, Playfair's, Leishman's, Bedford's, Chailly-Honoré's, Naegele-Grenser's and Siebold's Treatises on Obstetrics. Spiegelberg consecrates a page and Schroeder half a page to this disease.

has been employed by J. Y. Simpson¹ and Fleetwood Churchill,² and not the more common name *puerperal tetanus*, because I intend in the following pages to consider tetanus and tetanoid spasms in their relation to any period of pregnancy, parturition, and lactation.

I. PUERPERAL TETANUS.

History.—Puerperal tetanus was known to the ancients. Aretæus intimates that women are very subject to the disease after abortion, and Archigenes mentions likewise abortion as a cause of tetanus.³

In modern times, the first case I find put on record is that of Currie in 1792.

In the first half of this century, a few stray cases were reported, and in 1849, Pitre-Aubinais,⁴ a French provincial practitioner, published a paper on the subject, reporting three cases, and called the disease puerperal tetanus.

Sir James Y. Simpson was the first who, in 1854, wrote elaborately on the subject. He himself had not seen any case, but he collected either from printed sources or through private communication twenty-eight cases, and made an interesting commentary on them. Thus Simpson has the honor of having been the first to examine the question in all its bearings and of having written an essay on it which ought to have secured the disease a place in all following treatises on obstetrics or puerperal diseases.

In 1870, Hervieux⁵ inserted a valuable chapter on this affection in his treatise on puerperal diseases. He added a few new cases, mostly from French journals, and divided them in two classes, true tetanus and tetany. He had very thoroughly investigated the histories of the cases known to him, and wrote in a most attractive and lucid way, but I think the desire of systematizing, which is so prominent a feature of French medical writers, has led him somewhat astray.

In 1871, the Danish journal *Ugeskrift for Læger*⁶ (Physi-

¹ J. Y. Simpson: *Obstetrical Works*, Philadelphia, 1856, vol. ii., p. 77.

² Churchill: *Diseases of Women*, 6th ed., Dublin, 1874, p. 801.

³ Hervieux: *Traité clinique et pratique des maladies puerpérales*. Paris, 1870, p. 1,011.

⁴ *Revue Méd. Chir.*, vol. v., pp., 149 to 159, Paris, 1849.

⁵ *L. c.*, pp. 1,011-1,025.

⁶ Third series, vol. xi., pp. 313-321.

cians' Weekly) brought an editorial on puerperal tetanus, mostly an abstract of Hervieux's description, but with two new cases which had been observed in Denmark.

In 1874, Lardier chose this subject for his *thèse: Du tétanos puerpéral consécutif à l'avortement et l'accouchement*. He gave a synopsis of the cases mentioned by Simpson and Hervieux, and communicated two new ones observed by Andral in Paris and by Parissis in Athens.

In his later editions, Churchill¹ has treated the subject of puerperal tetanus at some length. He repeated mostly what Simpson had said, and added a few cases culled from the literature published after that author's article.

Besides, there have from time to time been published isolated cases in journals.

I have examined a considerable number of these and united in the table to be found below all the cases I have found.² Having spent much time and labor in studying this important subject, I have thought that it might interest some of the readers of this JOURNAL to get in condensed form information in regard to it, which else only is to be found in little accessible books or scattered through old journals. By so doing I hope also to contribute my mite toward securing for the description of this disease the place which it certainly merits in our text-books.

Frequency.—True tetanus is, in America and Europe, a very rare complication of the puerperal state. Besides the cases tabulated below, two cases are mentioned in the Registrar-General's reports of the causes of death in England as having occurred after childbirth.³ Denham is said⁴ to have reported three cases after abortion accompanied by much hemorrhage; one case after labor at full time, complicated with severe hemorrhage and adherent placenta; and a case in

¹ L. c., pp. 798 to 805.

² In order to save time to possible successors, I will state that I have examined the AMERICAN JOURNAL OF OBSTETRICS, Nashville Medical Journal, Pacific Medical Journal, New York Medical Record, Virginia Medical Monthly, New Jersey Medical Reporter, Philadelphia Medical and Surgical Reporter, Boston Medical and Surgical Journal, Richmond and Louisville Journal, New Orleans Medical Journal, American Journal of Medical Sciences, Medical Examiner, 1845-1856, Ranking's Abstract, Schmidt's Jahrbücher, and Centralblatt für Gynäkologie.

³ Monthly Journal, Edinburgh, April, 1850.

⁴ Dublin Quarterly Journal, 1865, vol. xl., p. 480.

A.—AFTER ABORTION.

NO.	PHYSICIAN.	AGE.	NUMBER OF PREGNANCY.	MONTH OF PREGNANCY.	DAYS ELAPSED AFTER ABORTION.	RESULT.	DURATION.	REMARKS BEARING ON ETIOLOGY.	LOWEST AND HIGHEST TEMPERATURE.	URINE.	TREATMENT.	REFERENCES.
1	Wood.....	36	7	4th	6	Died	3 days	.....	.....	.....	Turpentine and tobacco enemias, Indian hemp.	Edinburgh Monthly Jour. of Med. Sci., vol. x., p. 387, 1856. Ibidem.
2	Malcolm .....	..	..	early	14	"	4 "	Had taken liberties with herself. Cymananche tonsillitis.	.....	.....	.....	.....
3	Hislop.....	..	..	3d	6	"	3 "	.....	.....	.....	Turpentine enemias, opium.	Simpson, l. c. (IV).
4	Symonds.....	41	7	early	7	"	3 "	.....	.....	.....	.....	Simpson (V).
5	Hôpital Cochin.. (?)	(?)	..	.....	..	"	.....	.....	.....	.....	.....	Velpeau: Essai sur les convulsions puerpérales, obs. 21, p. 232 (these de concours). Lardier: l. c., p. 9.
6	Ritchie.....	40	8	3d	12	"	7 days	Mental agitation...	.....	.....	Calomel, opium...	Simpson (VII).
7	Lanark.....	..	..	3d	8	"	3 "	.....	.....	Sect. nat'al	.....	Simpson (VIII).
8	Tyler	40	2	4th	13	"	3 "	Placenta previa, severe hemorrhage, tampon.	.....	.....	.....	A. Tyler: Dublin Quart. Jour., No. vi., May, 1847, vol. iii., p. 360.
9	Macgregor	27	4	3d	7	"	2 "	Hemorrhage, plug	.....	.....	Heat, opium, cantharis in d i c a, chloric ether.	Edinb. Med. Jour., vol. x., p. 73, 1864.

No.	Locality	Age	Sex	Time of day	Duration	Onset	Character of attack	Course	Termination	Remarks
10	Wiltshire	.....	..	..	few	died	speedily	Supposed artificial abortion.	.....	.....
11	Wiltshire	.....	..	early	few	"	8 days	Mental depression.	.....	Chloroform, opium
12	Wm. A. Gordon, New Bedford, Mass.	5	..	early	8	"	"	Only one day in bed, exposure to cold.	.....	Purgatives, mustard poultice, hot poultices and fomentations, opium, calomel, etherization.
13	Wm. A. Gordon, New Bedford, Mass.	6	early	4	"	"	2	Artificial abortion, moderate hemorrhage.	.....	Do.
14	Wm. A. Gordon, New Bedford, Mass.	3	.....	10	"	"	8	Flooding, tampon.	.....	Do.
15	H. Banga, Chicago, Ill.	33	7	2d	4 weeks	"	6	Retained piece of placenta, subinvolution.	.....	Chloroform, ice bag on head and ice lumps internally.
16	W. G. Frost, Danversport, Mass.	35	13	3d	7 days	"	8	Hemorrhage, tampon.	.....	N. Y. Med. Rec., vol. xvii., p. 105, 1880.
17	A. A. Thompson and J. A. Mac-lay, Newburg, Cumberland Co., Pa.	..	..	2d	8	recovered	more than a month	Hemorrhage, tampon, exposure to cold.	.....	Phil. Med. Surg. Reporter, vol. xvii., p. 313, 1867.

A.—AFTER ABORTION.—Continued.

NO.	PHYSICIAN.	AGE.	NUMBER OF PREGNANCY.	MONTH OF PREGNANCY.	DAYS ELAPSED AFTER ABORTION.	RESULT.	DURATION.	REMARKS BEARING ON ETIOLOGY.	LOWEST AND HIGHEST TEMPERATURE.	URINE.	TREATMENT.	REFERENCES.
18	C. M. Green, Boston.	36	7	3d	15	died	3 days	Manual extraction of placenta, hemorrhage, tampon.	norm.	.....	.....	Bost. Med. & Surg. Jour., vol. cii., p. 493, 1880.
19	Baart de la Faille	39	9	3d	12	"	4 "	Hemorrhage, tampon.	98.1—107.6	no albumen	Chloroform, chloral, morphia subcutaneously.	Beitr. z. Gtbl. u. Gynäk., vol. ii., p. 30, Berl. '72.
20	E. T. Heiberg	30	4	1, or 2.	8	"	1 day	Hemorrhage (fetor not found).	.....	.....	Opium, chloroform imminent.	Ugeskrift for Læger, 3d ser., vol. xi., p. 427, 1871.
21	Dossaboy.	26	5	3d	6	recov.	15 dys	Hemorrhage.	.....	.....	Hemp, quinine, generous diet.	Brit. & For. Med. Chir. Rev., vol. xviii., p. 210, '56.
22	Moore.	34	..	3d	8	died	13 "	Hemorrhage, emaciated from want of food.	.....	.....	Opium, calomel, Indian h e m p blisters, turpentine enema.	Dublin Quarterly Jour., vol. xxi., p. 225, 1856.
23	Annan.	28	5	5th	13	"	6 "	Severe flooding, got up on 4th day.	.....	.....	Opium, calomel, tobacco enema.	Edinb. Med. Jour., vol. ii., p. 436, '57.
24	Parissis	38	7	4th	11	"	3 "	Hemorrhage, pieces of placenta retained three days, anger.	39—40.8	.....	Opium, enema of valerian.	Lardier, l. c., p. 26.
25	Boyd.	..	1	3d	6	"	6 "	Anæmia, hemorrhage, plug, tedious expulsion of secundines.	.....	.....	Chloral, chloroform.	Dublin Monthly Jour., vol. lvii., p. 583.

B.—AFTER PARTURITION.

NO.	PHYSICIAN.	AGE.	NUMBER OF PREGNANCY.	MONTH OF PREGNANCY.	DAYS ELAPSED AFTER PARTURITION.	RESULT.	DURATION.	REMARKS BEARING ON ETIOLOGY.	LOWEST AND HIGHEST TEMPERATURE.	URINE.	TREATMENT.	REFERENCES.
26	Lyell.....	25	1	term	6	Died	6 days	.....	.....	.....	Opium, venesection, turpentine enema.	Simpson (IX).
27	Lever.....	.....	.....	.....	3	"	3 "	Lacerated perineum.	.....	.....	Opium.....	Simpson (X).
28	Mackinley.....	27	2	term	31	"	3 "	Hemorrhage 25 days after delivery, tampon.	.....	.....	.....	Simpson (XI).
29	Humph'y Storer, Boston.	38	3	"	7	"	2 "	Retained placenta.	.....	.....	.....	Am. Jour. Med. Sc., 1842, vol. iii., p. 100.
30	Pitre-Aubinais..	30	1	"	4	"	6 "	Exposure to cold.	.....	.....	Leeches, cupping, heat, purgative.	Revue Méd. Chir., vol. v., pp. 149-159. Paris, 1849. Do.
31	Pitre-Aubinais..	28	2	7th	5	recov.	20 "	Eclampsia before parturition, cold water internally.	.....	.....	Blisters, warm baths.	Do.
32	Pitre-Aubinais..	34	4	term	5	"	10 "	Wet and cold.....	.....	.....	Musk, valerian, warm baths, bled six times, a hundred leeches.	Do.
33	Fournier-Pescay ..	.....	.....	.....	6	"	.....	Cold .....	.....	.....	Bleeding, leeches, warm baths, hot drinks.	Dict. des Sc. méd., Paris, 1821, vol. iv., p. 15.
34	Colles .....	.....	6	.....	14	ded	2 "	Cold .....	.....	.....	Opium, mercurial ointment.	Dubl. Quart. Jour., No. xxx., May, 1853, p. 288.

B.—AFTER PARTURITION.—Continued.

NO.	PHYSICIAN.	AGE.	NUMBER OF PREGNANCY.	MONTH OF PREGNANCY.	DAYS ELAPSED AFTER PARTURITION.	RESULT.	DURATION.	REMARKS BEARING ON ETIOLOGY.	LOWEST AND HIGHEST TEMPERATURE.	URINE.	TREATMENT.	REFERENCES.
35	Christie.....	..	1	.....	2	died	.....	.....	.....	.....	Opium, mercury, warm baths.	Ed. Med. & Surg. Jour., 1812, vol. viii., p. 415.
36	Dickinson.....	..	.....	.....	soon	"	5 days	.....	.....	.....	Opium, blisters, mercurial ointment.	Simpson (XIX).
37	Finucane.....	..	5	.....	5	"	1 "	Placenta previa, turning.	.....	.....	Bleeding, calomel, opium, enemas of turpentine, asafetida, tobacco.	Lancet, June, '88, p. 338.
38	Dubois.....	25	1	term	17	"	5 "	Cesarean section..	.....	.....	Leeches, opium, warm baths, belladonna.	Lancet, Feb. 1840, pp. 821-822 and 852.
39	Merriman.....	..	.....	.....	.....	"	.....	.....	.....	.....	.....	Simpson (XXIII).
40	Unknown.....	34	.....	.....	.....	"	.....	.....	.....	.....	.....	Simpson (XXIV).
41	Unknown.....	35	.....	.....	.....	"	.....	.....	.....	.....	.....	Simpson (XXV).
42	Symonds.....	yg	.....	pre-mature	soon	recov.	ready	.....	.....	.....	Turpentine injection.	Cyclop. of Pract. Med., vol. iv., p. 674. Lon., 1835.
43	Currie.....	..	.....	.....	.....	"	ready	Difficult labor....	.....	.....	Cold baths.....	Mem. of Med. Soc. Lond., vol. iii., p. 154, 1792.
44	Craigh..	37	8	term	9	died	2 days	Retained placenta, hemorrhage.	.....	.....	Hot poultice. Indian hemp.	Edin. Med. Jour., vol. xvi. Part 2, p. 25, 1870.

45	Macdonald.....	24	3	3 wks before term	11	"	8 hrs.	Nursing her previous child up to labor, anemic.	101 (vaginal)	No albumen	Chloral 3 ss, in enema twice.	Obst. Jour. Gr. Br. & Ir., vol. iii., p. 516, 1875.
46	Padova and Bianconi.	27	8	begin. 9th mo'th	5	"	2 days	Parts of placenta could not be removed.	88.4-102.7	.....	Cupping, leeching, Chloral, warm bath, curare.	Schmidt's Jahrb., vol. clx., p. 264, 1873.
47	Levertin .....	.....	ml-tips	term	14	"	4 "	Normal puerperal state.	-104°	Cons.	.....	Ctrl. f. Gynäk., vol. iii., p. 631, 1879.
48	M. Salomonsen.	24	1	term	25	died	3 days	Hemorrhage during parturition, parametritis, diphtheria (throat), convalescence.	.....	albumina	Warm bath, morphia subcutaneously.	Ugeskrift for Læger, 3d ser., vol. xi., p. 313, 1871.
49	Kjeldahl. ....	.....	9	"	9	"	2 "	Difficult removal of placenta, hourglass contraction, hemorrhage, metritis, convalescence.	.....	.....	Warm bath and opium "without the least relief."	Ibidem, p. 315.
50	Levy .....	.....	.....	"	7	"	1 "	Peritonitis. ....	.....	.....	Opium.	Ibid., p. 316, from Hosp. Meddelelser, 1851.
51	Levy .....	.....	.....	"	a mo'th	"	7 "	Abscess at elbow (probably pyemic).	.....	.....	.....	Ibidem, p. 317.
52	Bölling	37	2	"	13	"	2 "	Precipitate birth, hemorrhage, hourglass contraction, difficult removal of placenta.	.....	.....	Calomel, camphor, opium.	Ibidem, p. 377.
53	N. C. Heerfordt.	22	1	"	10	"	3 "	Cold ? .....	.....	.....	Chloroform liniment.	Ibidem, vol. xxvi., p. 113, 1878.

B.—AFTER PARTURITION.—Continued.

NO.	PHYSICIAN.	AGE.	NUMBER OF PREGNANCY.	MONTH OF PREGNANCY.	DAYS ELAPSED AFTER PARTURITION.	RESULT.	DURATION.	REMARKS BEARING ON ETIOLOGY.	LOWEST AND HIGHEST TEMPERATURE.	URINE.	TREATMENT.	REFERENCES.
54	D'Outrepont.....	.....	.....	term	3	recov.	.....	Scabies ! .....	.....	.....	Leeches, calomel, Autenrieth's ointment of tar tar emetic.	Siebold: Journ. f. Gbhl., vol. xiii, p. 204, 1834.
55	Patterson.....	.....	5	"	12	died	13d'ys	Cold.....	.....	.....	Opium, chloroform liniment, blister, potass. iodide, prussic acid, turpentine enema, assafoetida, valerian.	Glasg. Med. Jour., vol. iv., No. 15, p. 274, October, 1856.
56	Andral.	43	7	"	9	"	8 "	Got up fourth day.	.....	No al- bum- en	Chloral, opium, cupping, chloroform spray on spine (100 gms). Bleeding.	Lardier, l. c., p. 23.
57	Trousseau	28	...	9th	14	"	1 "	Syphilis, marasmus, cold.	.....	.....	.....	Trousseau, l. c., ii., p. 155.

a cow after calving, where the placenta had also been adherent. But since no details are found in the reports, not even the issue, I have not been able to admit them in the tables.

I have been obliged to exclude two of the cases mentioned by Simpson, his own, because it occurred after removal of a polypus, and stood in no relation to pregnancy or the puerperal state; and Mulder's, because it does not seem to have anything to do with tetanus, still less with puerperal tetanus. Baart de la Faille¹ who lives in Groningen, the very place where Mulder had operated on the patient in question, states that the cause of death was sloughing of the wound (*Verjauchung der Operationswunde*). Mulder had performed excision of the knee-joint. Two months after that, and seven weeks after confinement, she died. Even if there has been any tetanus, which De la Faille thinks is a mistake, it might with greater reason be attributed to the wound left by the operation than to the fact that she had given birth to a child seven weeks before, which, as we shall see, is too remote a period for puerperal tetanus to occur.

The same author states² that no case of puerperal tetanus is mentioned in the reports from the lying-in institutions of Vienna, Berlin, London, and Paris. Denham³ says likewise that no case has ever occurred in the Rotunda of Dublin, and that Merriman's synopsis of difficult labors contains 10,190 cases with 106 deaths, only one of which is noted as having been produced by lockjaw.

Etiology.—The influence of climate is shown by the fact that while this disease is so rare in America, even in the Southern States, and in Europe, it is very common in India. Waring⁴ states that in the three years ending December, 1853, no less than 232 women are recorded as having perished from puerperal tetanus at Bombay. During the same time there were only 2 cases of puerperal convulsions (eclampsia). This frequency of puerperal tetanus is even enormous when compared with the frequency of tetanus from other causes in the

¹ Beiträge zur Geburtshülfe und Gynäkologie, vol. ii., No. i., p. 35. Berlin, 1872.

² Loc. cit., p. 30.

³ Loc. cit., p. 480.

⁴ Indian Annals, April, 1856. Br. and For. Med. and Chir. Rev., vol. xviii., p. 431, October, 1856.

same locality. During the same three years the total number of deaths at Bombay was 42,651. Of these, 912, or 1 in 469, were due to tetanus. In this computation the puerperal form of the disease is excluded. Thus the cases due to the puerperal state form more than one-fifth of the entire number of cases from all sources.

Playfair¹ has likewise seen many cases at Calcutta, and Chassaniol² has frequently observed the disease in negroes on the borders of the Senegal. Thus there is no doubt but that a *hot climate* is a predisposing element, and that the *colored races* are more liable to be attacked than the white.

The season does not seem to have a very marked influence. In the temperate zone it has scarcely any, or at least the number of cases on record is too small to render this influence appreciable. In India there is some preponderance on the side of the *wet season*. Waring states that 54.4 per cent of the above-mentioned cases occurred from May to October, the wet season, and only 45.5 per cent from November to April, which is the dry season.

The disease is decidedly more common in the *country* than in city practice. In lying-in institutions it is next to unknown. This goes far to show that infection from without has little, if anything, to do with its production. May be the preponderance in rural districts is due to the greater recklessness of the population and their liability to exposure to wet and cold.

The influence of *age* is very marked. It is evident that an advanced age is a predisposing circumstance, and it seems especially that abortion occurring in later years is dangerous. Among 15 abortion cases in which the age is indicated, the lowest age was 26 years, the highest 41 years, and the average 34.87 years. Among 18 parturition cases, the lowest age was 22 years, the highest 43 years, and the average age in this class is only 30.55.

Arranged in groups of five years, the cases show still clearer that tetanus is especially liable to attack women who abort at a later period of life.

¹ London Obst. Trans., vol. xiii., p. 140, 1871.

² Schmidt's Jahrbücher, vol. clx., p. 264.

	Abortion.	Parturition.
21-25 years,	0 cases.	5 cases.
26-30 "	4 "	5 "
31-35 "	3 "	4 "
36-40 "	7 "	3 "
41-45 "	1 "	1 "
	<hr/>	<hr/>
Total	15	18

Thus more than one-half of the women who got tetanus after abortion were over 35 years old, while not one-fourth of those who were attacked after parturition were so advanced in age.

In regard to the *number of pregnancies* which the patients have undergone before being attacked by tetanus, there seems likewise to be a difference in predisposition between women who abort and those who are confined at or near the full time. It appears from the examination of the table that of 17 women who were seized after abortion, 5, or almost one-third, were in their seventh pregnancy, while of 19 who went to the end of pregnancy, 6, or almost one-third, fell a prey to the disease in their first pregnancy.

	Abortion.	Parturition.
Iparæ,	0	6
IIparæ,	1	3
IIIparæ,	1	2
IVparæ,	2	1
Vparæ,	3	2
VIparæ,	2	1
VIIparæ,	5	1
VIIIparæ,	1	2
IXparæ,	1	1
XIIIparæ,	1	0
	<hr/>	<hr/>
	17	19

In order to ascertain if really the first confinement predisposes to tetanus, we must examine if the six primiparæ were not perhaps advanced in age. The age is indicated in five cases as 22, 24, 25 (twice), and 30 years. Thus it is evident that these women were quite young, and the first confinement seems, therefore, to contain a danger in itself in regard to

tetanus. The same principle may be extended to the following pregnancies. A glance at the table shows that among abortion cases the figures increase almost steadily up to the seventh pregnancy. That they then diminish is a natural consequence of the scarcity of a greater number of pregnancies in the same woman. Among parturition cases, on the contrary, we see the figures become steadily smaller up to the seventh pregnancy.

The *puerperal state* itself must be looked upon as a predisposing cause. Common tetanus is comparatively rare in women. Hasse,¹ in his treatise on nervous diseases, states that of two hundred and fifty-two cases of tetanus, two hundred and ten occurred in men, and only forty-two in women, and yet that author remarks that the female sex in the lower classes is as much exposed to those small wounds of the fingers and toes which, much more commonly than severe injuries, give rise to tetanus. Likewise, they are, at least in some countries, often exposed to wet and cold. If we take this usual comparative immunity of the sex into consideration, puerperal tetanus is, perhaps, not so very rare a variety of tetanus, and we may therefore infer that the puerperal state in itself predisposes to the disease. This is so much more likely, as we know that women in this condition, upon the whole, are much more liable to be taken sick. The above-mentioned statistics from India show that the puerperal state is a very common cause of tetanus in that country.

It is commonly stated that tetanus is more common after abortion than after confinements at term; but it will be seen by my table, which contains all reported cases, that the confinements are in a very marked majority as compared with abortions, thirty-two belonging to the former, and only twenty-five to the latter class.

Mental excitement seems to have some influence, although scarcely as much as Wiltshire would vindicate for it. This observer's first case was that of a lady who, during the absence of her husband abroad, became pregnant illegitimately. But at the same time it is supposed that abortion was induced by instruments at an early period of gestation.

¹ Krankheiten des Nervensystems, Virchow's Pathologie und Therapie, vol. iv., Part I., p. 182. Erlangen, 1855.

His second case is more decisive. It was the wife of one medical man and the sister of another, consequently a lady in whom we may suppose some refinement of feeling and keen resentment of ill-treatment. For some time she had been separated from her husband, but during a reconciliation she became pregnant. She was soon, however, again deserted, under circumstances of peculiar aggravation and cruelty.

If, in the preceding cases, anxiety and grief were involved, in the following the outburst of tetanus seems due to passion. In Parissis' case, the patient, a few hours before the attack, had become very angry with her son, a boy of twelve or thirteen years. But, at the same time, we cannot overlook that pieces of the placenta had been retained in the womb for three days, and that the patient had lost much blood.

Ritchie's case is one of more value as bearing on the question of the influence of mental excitement, although also here some clots passed from the vagina on the eleventh day after abortion. Next day, when she was about to chastise a child, the woman was seized with lockjaw, succeeded by a sense of suffocation in the throat, and two days thereafter by tetanic spasms and cramps in the muscles of the neck and back, and by acute shooting pains in the articulation of the lower jaw. Improvement took place, under treatment, to such an extent that the tetanic spasm ceased. But during the sixth day after the commencement of the tetanus, she again became excited, was seized with general rigidity of the muscles of the body, and died the next day.

It appears clearly from the histories of the single cases that *hemorrhage* is one of the most important causes. This item recurs in no less than nineteen out of fifty-seven cases, or once in three cases. Simpson had already noticed that in the cases collected by him there had been hemorrhage in three out of seven cases after abortion;¹ but he seems more inclined to accuse the plug used to check the hemorrhage than the loss of blood itself. This view is not borne out by my more comprehensive material. In twenty-five abortion cases followed by tetanus, hemorrhage had occurred fourteen times, but in six of these the tampon was not used.

It seems, therefore, more likely that it is the weakening influ-

¹ L. c., p. 66.

ence of the loss of blood which is the real cause. This view is corroborated by the fact that other drains on the system may have a similar effect. In Macdonald's case, tetanus is ascribed to anemia, induced by the patient having suckled her previous child up to her next confinement. We shall later see that Trousseau¹ found that tetany, the intermittent form of tetanus, which, to say the least, is intimately related to tetanus, had lactation for its principal cause.

In several cases, I have noticed that the patient left her bed too early. Thus Gordon's first case staid only one day in bed after abortion, and then she exposed herself to cold. Andral's patient got up on the fourth day after confinement at term.

In some cases, some kind of *operation* had been performed. In Gordon's second case, artificial abortion had been brought on with moderate loss of blood. In Wiltshire's first case, we have seen above that a similar proceeding was surmised.

Finucane delivered his patient by turning, on account of placenta prævia. More or less difficult removal of the placenta is noted in several cases (Green, Kjeldahl, Bölling). The two last physicians had to overcome hour-glass contraction of the womb. Padova and Bianconi had to leave parts of the placenta on the uterine wall in a confinement in the ninth month. Pieces of placenta were retained for three days after abortion in Parissis' case. At the autopsy, performed four weeks after abortion, in Banga's case, a piece of the size of a nickel was found on the uterine wall, combined with metritis. In Storer's case of confinement at term, the whole placenta was left in the uterus. The lochia were offensive. The patient had chills. On the sixth day, three small pieces of the size of English walnuts came away. The next day, the tetanus began. Paul Dubois had performed Cesarean operation, and the patient did very well for seventeen days before the tetanus set in.

Exposure to *wet and cold* seems to have a decided influence in producing the disease. Pitre-Aubinais' first patient was a poor shoemaker's wife. On the fourth day, while drenched by perspiration, she got up and walked with naked feet on a floor moistened by rain-water, which found an easy access through the walls of her miserable abode. The sweat was suddenly suppressed, and the lochial discharge stopped at the

¹ Clinique Médicale, 2d ed., vol. ii., p. 145. Paris, 1865.

same time. This was immediately followed by the beginning of tetanus.

The same observer's second case was in the seventh month of her pregnancy, and was taken with eclampsia followed by expulsion of a child in beginning decomposition. On the fifth day, while bathed in perspiration, the patient got out of bed and drank half a litre (somewhat more than a pint), of very cold water. This imprudence was immediately followed by the occurrence of tetanus.

His third case had been delivered four days before. She was likewise bathed in perspiration, when she was informed that her cow had fallen into a bog. She got up, went out through the pouring rain, in the month of November, without an umbrella, helped to pull out the animal, and did not return to her home before an hour after she had left it. Perspiration and lochia stopped for a time, and two days later she was seized with tetanus.

Fournier-Pescay saw tetanus appear in a woman who on the sixth day after her confinement went to a privy constructed on a river, and exposed to all winds. The lochial discharge was arrested. Ten or twelve hours later, all her muscles were contracted.

Colles states simply that his patient was exposed to cold a fortnight after confinement. The same was the case on the eleventh day with Patterson's patient.

Trousseau's patient had since her confinement several times got up during the night, and fetched water at a fountain in the yard of the hospital. Immediately after one of these hazardous expeditions, she was seized with an attack of tetanus, which cost her her life.

Andral's patient got up the fourth day. Malcolm's patient had "taken liberties with herself," and acquired cynanche tonsillar.

Gordon's first case stayed only one day in bed after abortion. After that she attended to her household duties. A week after, on the evening before she was seized with tetanus, she sat a considerable time outside the door upon the door-sill, her feet resting upon the stone door-step.

Thompson and Maclay's patient had had profuse hemorrhage after abortion. It was controlled by a tampon. On the seventh

day she exposed herself to currents of wind loaded with moisture. The following day, the tetanic symptoms began.

Heerfordt's patient, suffering from the great heat at the end of June, had exposed herself to refrigeration by casting off the bed-cloths.

Pitre-Aubinais thinks that the cause is almost always the suppression of the lochia, or of profuse perspiration during milk-fever. These suppressions are probably due to the influence of cold on the skin. In most cases they are not mentioned. Craigh states even expressly that, in his case, milk secretion and lochial discharge went on till the patient's death.

Other conditions which I find mentioned, and which may perhaps have caused tetanus, are lacerated perineum (Lever); eclampsia before confinement (Pitre-Aubinais' second case), which seems more likely than that tetanus should have been induced by the drinking of cold water, as the author thinks; peritonitis (Levy), and abscess at elbow (Levy). These last two cases were probably of an infectious nature. As a mere curiosity, I call attention to d'Outrepont's case, which was believed to be a metastasis of scabies, which had disappeared from the skin! When the eruption appeared again on the skin, the tetanus ceased. In many histories nothing bearing on causation is to be found. Levertin states expressly that the disease came on without apparent cause.

Preceding Throat Trouble.—In some of the histories we find some kind of throat affection arise before the tetanus. Thus in Wood's case there was "sore throat," perhaps part of the tetanus itself. In Malcolm's case tetanus followed "a severe attack of cynanche tonsillaris." Salomonsen's patient had had diphtheritic patches in the throat.

Month of Pregnancy.—Tetanus has a decided predilection for abortions occurring in the earlier months of pregnancy, especially the third. Thus of twenty-two cases, ten occurred in the third month, and five "early."

First month 1 (perhaps 2d).

Second " 2

Third " 10

Fourth " 3

Fifth " 1

"Early" 5—22

The parturition cases had almost all gone their full time. Of thirty-two patients only one (Pitre-Aubinais) was confined in the seventh month, one is stated to be "premature" (Symond) and three were more or less advanced in the ninth month.

Time after Delivery.—Waring (l. c.) states that a woman is liable to be seized with tetanus any time from delivery up to the eighteenth day, but that the liability diminishes greatly after the sixth day. My table shows that cases may even occur as late as a month after confinement.

Days.	Abortion.	Parturition.
"Few"	2 cases. . . .	"soon" 2 cases.
2.	0 "	1 "
3.	0 "	2 "
4.	1 "	1 "
5.	0 "	4 "
6.	4 "	2 "
7.	3 "	2 "
8.	5 "	0 "
9.	0 "	3 "
10.	1 "	1 "
11.	1 "	1 "
12.	2 "	1 "
13.	2 "	1 "
14.	1 "	3 "
15.	1 "	0 "
17.	0 "	1 "
25.	0 "	1 "
4 weeks	1 "	0 "
1 month	0 "	2 "
	—	—
	24 cases.	28 cases.

Definition.—In order to make clear what is meant by tetanus, it may not be superfluous to recall that it is an acute disease characterized by tonic contractions of the voluntary muscles, intercurrent convulsions of the same, and increased reflex irritability.¹

Symptoms.—The symptoms of puerperal tetanus do not in

¹ Thambayn, Schmidt's Jahrb., vol. 112, p. 219.

any way differ from those of tetanus produced under other circumstances, and shall therefore not be described here in detail. The disease begins always at or near the neck. Sometimes inability to open the mouth, due to contraction of the masseters, is the first symptom noticed, at other times difficulty in swallowing produced by the constriction of the pharyngeal muscles, in other cases again stiffness of the muscles of the neck calls first the attention to the fact that something is wrong. The mouth is drawn so as to simulate a smile (*risus sardonius*), the eyebrows are contracted, the expression is that of suffering and anxiety. During a paroxysm the eyes are drawn back in their sockets, and are wide open. The pupils become very much contracted and do not react on light. If the face is flushed and swollen, or pale and livid depends exclusively on the condition obtaining in the larynx.¹

We have said that usually the masseters are contracted and the mouth closed. From this rule Ritchie's case forms a rare exception. Here the mouth was thrown widely open during the paroxysms by the contraction of the submaxillary muscles, but even in this case these paroxysms were succeeded by intervals in which the jaws became firmly closed.

Commonly the tetanic contractions extend soon from the head to the trunk and the extremities. In Dossabhoy's case trismus alone was present for six days, then came stiffness of the abdominal muscles for twelve days, before contractions of the back and lower extremities set in.

As a rule the muscles on the posterior surface are more powerfully contracted than their antagonists, so that during a paroxysm the patient rests only on head and heels. *Emprosthotonus* is of much rarer occurrence than *opisthotonus*. In Paterson's case are noted jerkings of such a character, and in Heerfordt's, there came twice a paroxysm which bent head and body strongly forward, but most of the time the muscles of the neck preponderated.

Generally the contractions are painful, but in some histories we read that the patient did not suffer much (Heerfordt and others). Since it has been noticed that the pain at the lower part of the sternum, by some authors designated as "precor-

¹ Thamhayn, l. c., p. 218.

dial," by others "as epigastric," which is so characteristic a feature in common tetanus, and probably due to tetanic contraction of the diaphragm, has been absent in some cases of puerperal tetanus, I will call the attention to the fact that severe pains in this region are especially mentioned in four cases (Andral, Moore's first, Heerfordt, Patterson).

In consequence of the painful contraction of the muscles and the intercurrent paroxysms, *restlessness* and *insomnia* are pretty constantly present.

The *intellectual forces* are as a rule entirely preserved to the last. Macdonald's case is the only exception, but the complete unconsciousness in this case is easily explained when we hear that the autopsy revealed extensive cerebral hemorrhage and destruction. Here, then, the unconsciousness was due to apoplexy.

The *temperature* in common tetanus may be raised, especially in the face, but it may also be considerably lower than normal.¹ Very few histories of puerperal tetanus give any information on this point. In Padova and Bianconi's case, it went down to 88.4° F., and rose to 102.7°; in Baart de La Faille's case, it ranged from 98 $\frac{1}{4}$ ° to 107.6°; in Parissis' case, it was all the time above the normal standard, varying between 102.2 and 105.4. In Macdonald's, it is noted as 101° in the vagina. In Levertin's, it reached 104°.

Dr. Ogle thinks it may be found that in tetanus the temperature always increases in the evening, and that a guide may be thus given for diagnosing true tetanus from certain cases of hysteria, and poisoning by strychnia and other substances.²

The *pulse* is quick and small.

The *sweat secretion* is commonly much increased.

Sometimes difficult and painful *micturition* is found. At other times, the bladder empties itself spontaneously. The urine does not contain any albumen. As an exception, we notice in Levertin's case "considerable albuminuria."

Constipation is a rather common complaint, but sometimes the bowels move involuntarily.

Duration.—Puerperal tetanus is generally of short dura-

¹ Thamhayn, l. c., p. 217.

² Nashville Journal of Medicine, vol. vii., p. 87, 1871.

tion. It may put an end to the patient's life in a few hours, and very few cases are protracted beyond eight days. Of 22 abortion cases, 19 lasted from one to eight days; of 25 parturition cases, 22 came to an end within the same brief space of time. The longest time observed in our cases is, for abortion, "more than a month;" for parturition, twenty days.

Death is due to sudden suffocation during a paroxysm, to asphyxia caused by protracted immobility of the muscles of the chest, or to exhaustion.

The *prognosis* is very bad, and especially much worse than in eclampsia. In 25 abortion cases, the disease terminated fatally twenty-three times; in 32 parturition cases, there were twenty-seven deaths and five recoveries. Thus, it would seem that the chances are not quite so bad after confinement as after abortion.

Diagnosis.—Tetanus is easily distinguished from *eclampsia*. Eclampsia is commonly combined with albuminuria, and there are, as a rule, casts in the urine. In tetanus, with rare exceptions, the urine does not contain any albumen nor casts. Eclampsia is usually ushered in by forebodings, such as cardialgia, headache, vertigo, edema of face and hands, light twitchings in the face, etc. Tetanus comes on suddenly. In eclampsia, the convulsions are clonic, or alternately clonic and tonic; in tetanus, they are tonic, with exacerbations. During an eclamptic attack, the patient is unconscious, and the convulsions are followed by deep coma. In tetanus, the intellect is perfectly preserved throughout the course of the disease. The tetanic paroxysms may be brought on by touch, noise and similar sensory impressions. Nothing of the kind is the case in eclampsia. In the latter disease, the patient feels, as a rule, much less pain. The temperature is not so high as in tetanus, at least in its later stage. In eclampsia the pupil is dilated; in tetanus it is contracted.

The diagnosis from *epilepsy* cannot present much difficulty. The history of the patient's previous health will in general reveal the fact of habitual seizures with convulsions. Often an aura is present. The contractions may indeed at first be tonic, but assume soon a clonic character. They are accompanied by loss of consciousness. The temperature is normal or

scarcely raised. The attack lasts at most a quarter of an hour. There are long intervals between the attacks.

The differentiation from *hysteria* may be more difficult. Indeed, all the muscles of the body may become tetanically contracted by hysterical spasms. Commonly the history will disclose that the patient is subject to similar attacks. There will usually be fits of laughing or crying, or tossing about in the bed, or some display of an egotistical interest in the morbid phenomena, or sudden changes from one state to another, which give the disease a particular stamp, and form a picture essentially different from that exhibited by the poor being racked by tetanus, with its constant contractions only interrupted by paroxysms, in which they increase in intensity, and spread to parts heretofore at rest.

Dr. Moore¹ describes a case of hysterical trismus, which occurred shortly after his case of real puerperal tetanus. The patient was a primipara. Her labor was tedious. She had been exposed to cold five days after labor. Her imagination had been worked up by the recital of the genuine case, which ended fatally. On the ninth day, the jaws were locked, but there was *no rigidity* of the masseters nor the cervical muscles. The mouth could be opened by instruments, and the patient could not close it again spontaneously. The contractions never spread to the body, and there were no paroxysms. The treatment consisted only in the administration of a cough mixture, and the assurance that the case did not present any danger. The patient improved much in two days, and continued after that to recover gradually.

Thamhayn, in his excellent article on tetanus in general,² in which he embodies all the more recent writings on this disease, points out that tetanus must be distinguished from *symp-tomatic tonic convulsions*, due to local affections of the nerve-centres, to excitation of the whole nervous system, to irritation of the spinal cord by an abnormal condition of the blood, such as found in small-pox, scarlet fever, typhoid fever, pyemia, etc., or to the irritation exercised locally on some nerves. Local affections of the brain or the cord may be differentiated from tetanus by the etiology, want of the par-

¹ Dublin Quarterly Journ., vol. xxi., p. 227, 1856.

² L. c., p. 219.

oxysm induced in tetanus by reflex irritation, and the absence of a periodical remittance. In affection of the nerve-centres, the tetanic contraction is limited to the upper or lower extremities, and it is soon followed by paralysis of the same parts.

Cases of general excitement of the whole nervous system are characterized by a different history, a marked contrast between the most severe paroxysms and complete relaxation, and take a quite different course.

Tetanic contractions, which are symptomatic of a morbid condition of the blood, occur at irregular intervals in the typical course of the diseases concerned. If due to malaria, the diagnosis will become clear by the intermittent character of the spasms.

True tetanus need not affect the whole muscular system. When limited to certain groups of muscles, it may be confounded with tetanic contraction due to the local irritation of particular nervous tracts. But by a careful examination of all circumstances, and by watching the course of the disease, it will probably be possible to differentiate the two conditions.

The case which prompted me to investigate the question of puerperal tetanus belongs to the category of tetanoid contractions produced by toxemia. For the details, I am mostly indebted to Dr. C. S. Allen, house-surgeon to the Maternity Hospital.

CASE.—*Tetanoid contraction symptomatic of uremia, acute interstitial, chronic parenchymatous nephritis.*

Hannah L., negress, age twenty-six, married, admitted May 8th, 1882, to the Maternity Hospital, pregnant with her second child.

Attention was not called to her while there until May 13th, the day before she was taken with labor pains. She had a severe chill that afternoon, followed shortly by a temperature of $103\frac{3}{4}^{\circ}$ F. Later in the afternoon temperature, 104° ; pulse, 120; respiration, 30. Complained of pain in either side of chest when she breathed, left side being most painful. Careful examination of the chest showed nothing other than respiratory sounds somewhat harsher than normal, and a few large mucous râles at the end of inspiration which were lost after coughing. Both sides of chest very sensitive on percussion; pain located more in the muscular tissue than elsewhere; all parts of the body somewhat sensitive, especially over muscular tissue. Patient stated that she was suffering from a severe attack of malaria up to the time of admission to the hospital, the chills coming on alternate days.

On May 13th gave ac. carbolicæ, gr. i., and aquæ 3 ss. by hypo-

dermic, and also gave sulph. quin. grs. x. and saline cathartic followed by grs. x. of quinine on the morning of the 14th. May 14th, A.M., temperature, 100° ; pulse, 98; respiration, 20. The same evening was taken with labor pains and after an easy labor was delivered of a child weighing but four and three-fourths pounds. Second stage lasted but fifteen minutes. On the evening of May 15th, temperature, 102° ; patient feeling well. May 16th, temperature, $97\frac{1}{2}^{\circ}$; patient in good condition all day; good appetite and uterus contracting down well; it was noticed she spoke very slowly and deliberately, and that it was with difficulty she opened her mouth far enough to protrude her tongue. May 17th, 10 A.M., found temperature in both mouth and axilla was but 93° F., being taken with great care, and several thermometers being used; face and extremities were very cold to the touch; pulse very weak and slow; patient said she felt well and had no chilly sensation or other disturbance; complained of great stiffness of the jaws with pains in the back of the neck and some difficulty in moving the head; said she felt as if she had contracted a severe cold and was suffering from stiff neck; she spoke more deliberately than yesterday and complained of slight difficulty in swallowing; mouth could not be opened wider than three-fourths inches; general tenderness more marked, especially at the back of the neck. Ordered hot bottles and blankets, also hot whiskey and water, q. s.; hypodermics of whiskey and digitalis also given. Large hot poultice applied over the abdomen. In spite of active treatment temperature rose very slowly; 11 A.M. temperature, 94° F.; 1 P.M., 96° F.; 3.30 P.M., $97\frac{1}{2}^{\circ}$ F.

Late in the afternoon chloral, grs. xv., every three hours, was ordered. Stimulants and hot bottles continued. At 9 P.M., temperature, $98\frac{1}{2}^{\circ}$ F. It was impossible for her to swallow anything solid and liquids were taken with difficulty. They were allowed to trickle slowly down with but few imperfect efforts at swallowing.

On examination no swelling or edema was to be found, body somewhat emaciated; abdomen retracted and quite sensitive; uterus well contracted; arms and legs moved with greater effort than normal. Patient lies sleeping most of the time, but when aroused her mind is perfectly clear and she talks rationally; digitalis, whiskey, and chloral kept up during the night.

May 18th, A.M., temperature, $98\frac{3}{4}^{\circ}$ F.; pulse, 108; respiration, 22; patient in good spirits but very drowsy; when awake suffers from stiffness of the muscles. Moving being very painful, she lies in one position most of the time.

May 19th. General condition much the same; nourishment only taken in minute quantities; urine on examination found to contain large amount of albumen; pulse evidently getting weaker, requiring stimulation with whiskey and digitalis; the condition of pulse and difficulty in swallowing caused inhalations of amyl nitrite to be substituted for the chloral, gtt. iii. every three hours. At one time during the night the patient became somewhat coma-

tose; pulse weak, irregular, and almost imperceptible at the wrist; hypodermic injections of whiskey and large doses of digitalis were found necessary and the patient seemed passing into a state of collapse, but revived later.

May 20th. Temperature, $95\frac{1}{2}^{\circ}$ F., in the vagina; pulse, 100 and weak; respiration, 32. Patient lay moaning in stupor; when aroused said she felt no pain unless she was touched; swallowing all but impossible; amount of urine very small. May 20th, patient lies on her back with flexed limbs in a drowsy condition, but understands questions, and answers rationally; no spontaneous pain; teeth can only be separated one-half inch and the masseter muscles are felt very hard and rigid; she swallows with great difficulty; both arms and left leg oppose some resistance to being stretched or bent; pressure on the muscles of the arms and trunk is painful, while the skin is not sensitive in the same places. On both legs hyperesthesia of the skin. Pulse, 112, weak; temperature, 98° in the vagina; both pupils equal and normal or slightly contracted.

May 21st. Patient would insist on keeping uncovered, although temperature in the vagina at 12, midnight, was but $96\frac{3}{4}^{\circ}$ F. Favorite position on right side with both arms and left leg projecting from the bed, in spite of being repeatedly replaced; objected strongly to hot bottles.

Hyperesthesia and pain on pressure same as yesterday; heart normal; percussion clear; some coarse râles at close of inspiration; pulse very weak and irregular, changing between 84 and 120. Swallowing all but impossible; no marked muscular resistance. Examination of urine taken with catheter: greenish-yellow, turbid, acid, spec. grav. 1022; boiled it precipitated about 25 per cent of albumen; microscopical examination of the small amount of sediment showed pus corpuscles and numerous granular and epithelial casts from straight and narrow tubes and epithelial cells from kidney and ureter. Nutrient enemas found necessary during the last twenty-four hours as patient could not swallow; they were not always retained.

May 22d. General condition much the same, but patient far weaker; very restless and somewhat delirious; would sometimes speak of absent friends; at other times a low unintelligible muttering; perspiration specially marked on the face; all parts felt cold and clammy; teeth separated with difficulty an inch and a half; limbs relaxed; hyperesthesia, probably in consequence of increased sopor, less marked; patient kept alive entirely by hypodermic medication. Wet pack, consisting of blanket wrung out in hot water was ordered.

May 23d. From 1 A.M. till 8 A.M. patient was only kept alive by constant stimulation; pulse would suddenly become very feeble, but each time rally under treatment. Nit. amyl and stimulating enema still kept up; mouth had to be washed out, as she was too weak to spit out the accumulated phlegm which seriously impeded breathing; large mucous râles in trachea and bronchi.

9 A.M., temperature, 101° F.; pulse, 120, weak; respiration,

44. During the day the comatose condition became more and more continuous. There was never at any time the slightest approach to convulsions; jaws alone remained somewhat rigid, but could be opened without much force; tongue could scarcely be moved at all; muscles of pharynx seemed completely paralyzed. Patient died at 1 P.M.

Autopsy and microscopical examination showed death to be due to kidney lesions, an acute attack of interstitial nephritis being ingrafted on a chronic parenchymatous nephritis. Nothing noticeable about uterus. Brain normal. Cord not examined.

Temperature Chart.

TEMPERATURE.			PULSE.		RESPIRATION.	
	MORN.	EVEN.	MORN.	EVEN.	MORN.	EVEN.
May 15th...	98	102½	80		24	
" 16th...	97½	99½	74	100	24	22
" 17th...	93	99½	74	80	16	20
" 18th...	98¾	99	92	108	22	26
" 19th...	97½	100	96	108	36	26
" 20th...	95½	100	100	100	36	32
" 21st...	99¾	102	84-120	120	50	60
" 22d...	98½	101½	120	120	44	46
" 23d...	101		120		44	

In this case we had only to do with tetanic contractions of the masseters, the muscles of the neck, of the tongue and the pharynx, and an approach to the same in the limbs. It was not tetanus as a separate disease, for the characteristic paroxysms were entirely absent.

We will defer to discuss the difference between tetanus and *tetany*, till we come to treat of tetanus in pregnancy and during lactation.

Morbid Anatomy.—As the morbid changes in the organism, which occasion tetanus in general, are very little known, we cannot expect to find much information in this respect about the particular kind of the disease which occupies us here. There are not many autopsies recorded, in fewer the cord has been examined, and in still fewer cases, the nerve-centres have been submitted to a microscopical examination, which would seem to be absolutely required for the discovery of the heretofore hidden structural changes.

Following the track indicated by Rokitansky, Demme has found that, in tetanus, a diffuse growth of connective tissue takes place, especially in the medulla, the walls of the fourth

ventricle, the crura medullæ ad cerebellum, the crura medullæ ad corpora quadrigemina, and the cord, especially the posterior columns. He thinks that this development of connective tissue is the result of protracted and repeated hyperemia of the affected parts.

In Macdonald's case, there were found blood-clots in all ventricles of the brain. Both corpora striata were torn up by hemorrhage. There was a firmly adherent thrombus in the straight sinus, and in venæ Galeni. This case differed from all others by the presence of profound unconsciousness, and it cannot be taken as a representative of puerperal tetanus, but may be the condition of hyperemia, which must have preceded the apoplexy, is the chief condition in tetanus.

In Andral's case, the upper part of the cord was found a little injected. In both of Levy's cases, there was emollition of the spinal marrow. In the one it had its seat in the cervical portions, in the other in the lower portion of the cord. In Levertin's case, the cerebral membranes were congested, while there was a pronounced paleness of the pons and medulla. In Trousseau's case, there were likewise found traces of venous congestion of the meninges, and nothing else. Padova and Bianconi's autopsy showed the pia mater of brain injected, serum under the dura of the cord, the brain and cord ischemic. Banga does not seem to have examined the nervous centres.

The uterus is in some cases stated to have been healthy (Andral, Trousseau). In Banga's case, the cavity contained a large quantity of a dirty mass of dark-red color, and creamy consistency. It consisted of a mixture of blood and detritus. The endometrium presented a smooth surface, excepting one spot, where there was found a projection as large as a nickel, presenting the appearance of a remnant of the placenta (no microscopical examination). Four weeks after abortion, occurring in the second month of pregnancy, the uterine tissue was three-fourths of an inch in thickness, but seemed rather bloodless. This description seems to indicate endometritis and subinvolution. In Padova and Bianconi's case, the uterus was full of gray fetid fluid, and a piece of gangrenous placenta adhered to the wall.

A point of particular interest is the condition of the kidneys,

as we know that in eclampsia they are, in the great majority of cases, found diseased. We have seen above that, as a rule, there is no albuminuria in tetanus. But there are exceptions. Among our own cases, the urine of Levertin's patient contained a considerable amount of albumen. Unfortunately he does not state if it contained any casts, nor does he mention the condition in which the kidneys were found at the autopsy. One of Pitre-Aubinais' patients having had eclampsia immediately before confinement, it may be surmised that she also suffered from albuminuria. Trousseau's patient had swollen hands and feet, and nothing is said about the urine.

A. Kussmaul¹ has described three cases of rheumatic tetanus in men in which the urine contained both albumen and hyaline and epithelial casts. All these patients recovered, so that their kidneys did not come under direct observation. As a substitute we can take the report of Julius Lehmann,² who made the autopsy of two patients having died of rheumatic tetanus. In neither case was there the least suspicion of chronic alcoholism. Nevertheless he found extensive parenchymatous inflammation in the heart, the liver, the *kidneys*, and slight tumefaction of the spleen.

Thus it would seem that nephritis is not altogether to be excluded in cases of tetanus, and that consequently the presence of albumen and casts in the urine, although a valuable sign in regard to the differentiation between tetanus and eclampsia, is not absolutely reliable.

Nature.—We have in the paragraph on etiology seen many circumstances and agents which must be regarded as predisposing or exciting causes of puerperal tetanus, and we have in the last paragraph mentioned the pathological changes found in the bodies of patients who have succumbed to the disease. But neither one class nor the other gives us much foothold for a rational explanation of the true character of puerperal tetanus. Here we are pretty much reduced to guess-work and ingenious analogies.

¹ Ueber rheumatischen Tetanus und rheumatische tonische Krämpfe welche mit Albuminurie verlaufen. Berliner klinische Wochenschrift, 1871, No. 41, p. 485.

² Bibliothek for Læger, January, 1868. Schmidt's Jhrb., vol. cxxxix., p. 241.

Simpson¹ took puerperal tetanus for a form of traumatic tetanus, the inside of the womb, after parturition or confinement, being in the condition of an external wound. Forestalling the objection that puerperal tetanus is so very rare in proportion to the number of wombs deprived of their decidua, he called attention to the fact that the uterus is almost entirely supplied with nerves from the sympathetic system, which is far less liable to give rise to tetanus than lesions of the cerebro-spinal system.

He thought that perhaps a special blood poison was generated either at the site of the wound or elsewhere, and might produce tetanus in a similar way, as we know strychnine and brucine do.

Secondly, he remarks that perhaps the poison works on the nerve-centres, as strychnine and brucine produce tetanic contraction when applied directly on the cord.

Thirdly, he says that the appropriate or specific action of the spinal cord or cerebro-spinal system, constituting traumatic tetanus, would appear sometimes, if not always, to be a condition propagated upwards along the nerves, from the seat of the injury or wound to the central portions of the nervous system, since the disease in some cases has been arrested by cutting the nerve-trunk leading from the injured place to the central organ. Such a propagation would have an analogy in electrical induction and transmission.

Tetanus is supposed by very many to be a zymotic disease (Betoli, Richardson, Roser, Wells, Thompson, Heiberg²). Levy had already in 1851, three years before Simpson wrote his paper on puerperal tetanus, ascribed this form of the disease to infection, and, as we have seen above, his cases invite much to this theory. Schroeder³ thinks likewise that it is due to infection, or at least to some particular irritation of the puerperal wound. If an infection takes place, it is almost sure that it is by a poison generated in the organism of the patient herself, and not brought as such from without. In this respect there is a fundamental difference between puerperal tetanus and septicemia (puerperal fever). The disease is almost unknown in

¹ L. c., p. 76.

² *Thamhayn*, l. c., p. 222.

³ *Lehrbuch der Geburtshülfe*, 5te Auflage, Bonn, 1877, p. 770.

lying-in asylums, the very hot-beds of septicemia, it is never brought from one person to the other, and it appears never as an epidemic.

Heiberg's infection theory is peculiar and ingenious. He calls attention to the fact that in tetanus we have two entirely different kinds of contractions, one continuous, the other intermittent. The first, he thinks, is independent of reflex irritability of the nervous system, but seated in the muscles themselves, and due to a blood poison being deposited in the muscular tissue. The intermittent paroxysms alone he takes to be referable to reflexes having their motor in the nerves.

Treatment.—We have learned above that post-mortem examinations have shown hyperemia of the nervous centres or their meninges, or a new development of connective tissue due to such hyperemia. The rational treatment of the disease would, therefore, seem to be antiphlogistic or derivative, and when we examine the eight cases which had the rare chance to recover, we find indeed that these formed an important part of or constituted the whole treatment. Currie saved his patient by plunging her into a *cold bath*. *Blood-letting*, either as phlebotomy or by leeches, or both combined, was used by Pitre-Aubinais, Fournier-Pescay, and D'Outrepont. One of Pitre-Aubinais' patients was bled six times, and had one hundred leeches applied. Thompson and Dessabhoy used large doses of *quinine*. *Calomel* was given by D'Outrepont. He also used a strong *ointment of tartar emetic*. *Blisters* were applied by Thompson, Pitre-Aubinais; *poultices* by Thompson. Symond's patient recovered after a *turpentine enema*.

The symptomatic indication is to relieve pain and quiet the nervous system by the administration of narcotics and antispasmodics. In the successful cases, we find mentioned the use of opium, cannabis indica, belladonna, chloroform, valerian, musk, tartar emetic, and warm baths.

In order not to deceive ourselves and nourish hopes of therapeutical results which probably will be frustrated by the event, we will remember that similar remedies were used in the cases which proved fatal. Besides, the number saved is so very small that there is a great call for improvement in the treatment. I shall, therefore, briefly mention some of the remedies that have proved useful in common tetanus, and make some remarks on the remedies used in puerperal tetanus.

Among the antispasmodics, tobacco enemas played formerly a great rôle. Since we now possess chloroform, chloral, and nitrite of amyl, it is better to desist altogether from that dangerous remedy.

Opium seems to have done little or no good in most cases, although given in enormous doses. Denham¹ mentions a lady who took 40,000 drops in twenty days, and another an ounce of solid opium in divided doses every day for twenty-two days. Salomonsen is the only one of those writing on puerperal tetanus who reports favorable effects of an opiate. He found that morphia administered subcutaneously produced a remarkable relaxation, so that the mouth could be opened, deglutition became possible, and the patient enjoyed several hours' sleep. But Baart de la Faille did not see any effect of the same medication.

Simpson praised *chloroform*, and said that, if it did not cure the patient, at least it relieved her sufferings. Banga likewise speaks of the excellent effect of this drug. Thompson and Maclay say that it rendered deglutition of opium and belladonna possible, but these drugs might have been injected subcutaneously. Gordon states that chloroform made his second patient feel worse after she came out of the narcosis, so that she asked its administration to be discontinued. The same observer found likewise, in his first case, that etherization increased the distress.

Chloral has proved experimentally to diminish the reflex activity of the cord, it dulls pain and lessens the temperature of the body. Thus it would seem to meet several of the symptomatic indications of tetanus, and has in fact been used with better results than most other drugs. But Baart de la Faille and Padova and Bianconi tried it without effect in puerperal tetanus.

Chloral is usually administered by the mouth in the dose of one gram, or by the rectum (two to four grams). Oré injected it into the veins of a man who recovered. This mode of administration works much more powerfully and rapidly, but, if not done slowly enough, may interrupt the respiration. If the solution is too concentrated there are formed grumous coagula in the vein, which might become dangerous. Vulpian ad-

¹ Dublin Quarterly Journ., vol. xl., p. 482, 1865.

vises, therefore, to use a twenty-per-cent solution. He warns likewise against injecting into the subcutaneous connective tissue.¹

Nitrite of amyl has the advantage of being so very easy to administer on account of the small amount required. In my case of tetanoid contraction, it seemed to have a decided relaxing effect on the muscles.

Curare, given in the dose of 0.03 ($\frac{1}{2}$ grain), and repeated seven times in Padova's and Bianconi's case, had only the effect of "producing local cessation of the spasms," whatever that may mean. *Calabar bean* has a similar paralyzing effect as curare, and has given some good results.

Aconite, given as Fleming's tincture (two to ten drops every hour), is praised by Paget and others.²

Bromide of potassium is recommended by Thomson, especially because it is an excellent antidote against animal poisons.

Demme recommends large doses of *iodide of potassium* as indicated by the formation of new connective tissue in the medulla and the chord, leeches, cupping, and ice-bags near the spine.

It would seem that the question, if we shall apply heat or cold, ought to be answered by a reference to the thermometer. In most cases, the temperature, as we have seen above, is elevated and even very high. In such cases, the ice-bag and the cold bath or cold affusion, with dry rubbing, which is a favorite remedy in the West Indies,³ might do good. But in other cases the temperature sinks to a dangerous degree, and then every effort should be made to warm the patient by hot bottles or bricks, warm bath, warm poultices, and hot drinks.

Heiberg recommends on theoretical grounds to rub the skin over the affected muscles with an ointment of *nitrate of silver*, one part to three of ointment, until it becomes black, and vesicles are formed. If the affection extends over a great part of the body, he would substitute painting with *iodine* dissolved in equal parts of ether. Further he recommends warm baths of long duration, which may be rendered more effective by the addition of twelve ounces of nitrico-muriatic acid.

¹ Lardier, l. c., pp. 55-57.

Thamhayn, l. c., p. 225.

³ Denham, l. c., p. 483.

Since constipation is a common feature, *laxative* medicines and enemas are called for in many cases.

Simpson¹ says that "no kind of local treatment to the seat of the original uterine lesion could be well applied or would probably be of any avail." I cannot share this view. As in several autopsies more or less of the placenta has been found in the uterus, *curetting* would seem to be the first indication where there is the slightest doubt in regard to the emptiness of the uterus. Next it seems to me that it would be wise to make some *disinfectant intrauterine injections*, especially a lukewarm two-per-cent solution of carbolic acid. If really some poison is being formed in the womb, it might be possible to limit its production or absorption, as is so successfully done in septic puerperal processes.

Tetanus being an exceedingly exhausting disease, great attention ought to be paid to the *diet*, which ought to be as nourishing and stimulating as possible. If food cannot be swallowed, it ought to be administered per anum. Nowadays we possess very excellent preparations suitable for such a purpose (Leube's extract of meat, Gaunt's peptones, desiccated blood, etc.). "Dr. Bush, the celebrated American physician," says Denham,² "looking upon the disease as one of debility, recommended bark, wine, and spirits in large doses. Nothing like intoxication is produced by it. In one case, related by Currie, the disease lasted six weeks, during which time the patient drank one hundred and ten bottles of port wine."

II.—TETANOID CONTRACTIONS DURING PREGNANCY.

Hervieux, in treating of puerperal tetanus, says that all the cases on record belong to two classes—tetanus and tetany. Thereupon he describes them as if they were two diseases, differing in time of occurrence, in symptoms, in gravity, and in treatment. Tetanus comes always after abortion or confinement; tetany comes always before labor. Tetanus is continuous; tetany is intermittent. Tetanus begins as trismus; tetany begins in the extremities. In tetanus there is high temperature and frequent pulse; in tetany temperature and pulse are unchanged. Tetanus is one of the most fatal dis-

¹ L. c., p. 80.

² L. c., p. 483.

eases; tetany ends almost always in recovery. All this sounds very nice, and is quite fascinating for a systematical spirit. It makes everything easy and smooth. Unfortunately this division and description do not correspond with what we find by examining the history of the cases. But before we go any further it might be good to say a few words about the disease called tetany. The disease was first described by Dance, in 1831, in the *Archives générales de Médecine*, in an article headed: *Observations sur une espèce de tétanos intermittent*. A. Delpech treated of it, in 1846, in his thèse, under the name of *spasmes idiopathiques musculaires*. In 1852, Corvisart proposed to call it *tétanie*. This word was adopted by Trousseau,¹ who consecrates a chapter in his clinique to the description of the disease, and under this name it is known outside of France. Trousseau distinguishes three forms—a benign, a middling, and a grave one. In the benign form there are only local manifestations, a tingling sensation in hands and feet, stiffness and pain. The hand commonly takes the coniform shape used when the accoucheur wants to pass it through the vagina, but sometimes the fingers become so bent that the nails leave traces on the skin. The hand is bent on the forearm, and this on the arm. The feet are in strong plantar flexion with bent toes and drawn up heels, legs and thighs extended. The contractions may simultaneously occupy the upper and lower extremities, or alternate between the two, or be limited to either of them. Commonly the hands are affected. The convulsed muscles offer resistance when one tries to change the position of the parts, and if he succeeds, the fingers become bent again when let loose, or exceptionally, they stay extended, but the muscles continue to be contracted. The muscles are hard to the touch. An attack lasts five, ten, fifteen minutes, or from one to two hours. Toward the end the tingling sensation returns, and thereafter the muscles become again movable until a new attack comes on. The whole disease lasts several days, or as much as three months. At any time during its course contractions can be brought on in an extremity by compressing the chief artery, vein, or nerve. There is some perversion of the sense of touch. An object held in the hand feels as if it were wrapt up in something. When walking

¹ L. c., p. 145, seq.

with naked feet on the floor, the patient has a sensation as if he walked on a carpet.

In the second degree, the patient feels more pain, and has fever. Different parts of the body become congested, and the extremities edematous. The muscular contractions extend to the trunk and the face. Trismus and difficult deglutition appear.

The third degree is only characterized by the prolongation and frequency of the attacks.

As causes of tetany, Trousseau mentions lactation, menstruation, the puerperal state, pregnancy, young age, diarrhea, cholera, typhoid fever, cold, etc.

The prognosis is good. He has only seen one fatal case, and this being most decidedly puerperal tetanus, I have followed Lardier's example, and placed it with the other cases in the preceding chapter.

Now, if this is tetany, then the three following cases are, as far as I can see, not tetany, although the spasms were intermittent.

1.—*Intermittent Tetanus.*

CASE LVIII.—Mikschick¹ describes the case of a girl, sixteen years old, primipara, eight months gone in pregnancy. Five days before her admission to the hospital, she was, without known cause, seized with very painful cramp in the fingers and toes of the right side. The forearm was bent, could be extended, but returned immediately to its former position. No fever. No cephalalgia. Child alive. Eight leeches were applied to nucha. The next day, the cramp of the right foot had quite ceased. Friction with chloroform oil. Third day, excepting a little stiffness of fingers, cramp quite stopped. Fourth day, same state, combined with some tension of the masticatory muscles. In the evening, a tetanic fit, not relieved by chloroform. From the sixth to the tenth day, the tetanic fits recurred with more frequency and violence. After large doses of opium, the affected parts became rather freely movable during two days. Then, on the eighteenth day, came a severe attack, in which she *died*.

CASE LIX.—Dr. T. Curtis Smith,² of Middleport, O., has reported the case of a woman, age not stated, who, in her fourth pregnancy, was seized with tetanic contractions the day before her delivery at term. She had been an invalid for many years,

¹ *Wochenblatt der Aerzte zu Wien*, No. 33, 1855. *Brit. and For. Med. Chir. Rev.*, vol. xviii., p. 209, 1856. *Schmidt's Jhrb.*, vol. xcvi., p. 260.

² *Philadelphia Med. and Surg. Reporter*, vol. xxix., p. 203, 1873.

passing half the time in bed. She had short, quick convulsive attacks, the jaws closing firmly for a minute, the head being thrown back; the extremities were rigid. Two grains of opium controlled the convulsive action, and allayed all pain, though it had to be repeated once during the night. The next morning, she had a slight convulsion. Then she was free till several hours after giving birth to a living child. The secundines were removed without trouble, no hemorrhage, but the patient was weak. About four hours after delivery, she was again strongly convulsed, jaws firmly set, extremities rigid, marked opisthotonos. The convulsive action was short, but would be repeated upon any very slight movement or noise. She grew better under opium treatment. Then a thunder storm broke out. At every flash of lightning or roar of thunder, she was seized with severe convulsions, and finally *died*.

Her intellect was perfectly clear, there were no grimaces, rolling eyes, or foaming mouth, no anasarca, no vertigo, no diminution of urinary secretion, all of which shows that it was not a case of eclampsia.

CASE LX.—Dr. James Collins¹ reported a case in 1876 to the Philadelphia County Medical Society. When called by a midwife to see a woman in labor, he found all the symptoms of tetanus complicating labor. After giving one-eighth of a grain of morphia hypodermically, finding the os dilated, he delivered her, as speedily as possible, of a dead child; the uterus contracting strongly, even violently. Everything went well till the second day, when the tetanic symptoms returned, and she *died* on the fourth day after the reappearance of the tetanic symptoms. The bromide of potassium, chloral, morphia, and other remedies failed, but she had immediate, although only temporary, relief from inhalations of nitrite of amyl. Neither laceration, wound, nor obvious cause of any kind was discovered; post-mortem examination refused.

All these three cases were intermittent, and began in the extremities, but nothing is stated about the pathognomonic shape of the hand, and they all died of their tetanic convulsions. From a practical stand-point, there seems therefore to be little difference between them and tetanus, and the treatment called for will be the one recommended in the preceding chapter.

2.—*Tetany*.

Gauchet² has published a case, treated in Hérard's service

¹ Philadelphia Med. and Surg. Reporter, vol. xxxvi., p. 129, 1877.

² Hervieux, l. c., p. 1,014.

in Paris, which seems to correspond well with the description given by Trousseau of tetany.

CASE LXI.—The patient, a flower-maker, thirty-three years old, suffered in the seventh month of her pregnancy repeatedly from stiffness of the upper and the lower extremities, followed by painful contractions of the same. The fingers were flexed in the hand, the hand against the forearm, the forearm against the arm. The toes, likewise, were bent, the feet forcibly stretched out (*i. e.*, plantar flexion). The legs were bent on the thighs. Next, the movements of the tongue were embarrassed, trismus was developed; she suffered from dyspnea and constriction at the base of the thorax. Six weeks after the beginning of these attacks she was delivered of a still-born child. The lying-in period was normal, and the patient got well. Treatment not mentioned.

In this history we notice the intermittence, the beginning in the extremities, the protracted course, and the favorable issue. No hysterical antecedents are reported.

3.—*Tetanoid Hysteria.*

In the first part of this paper, while speaking of the diagnosis of puerperal tetanus, we have pointed out its difference from hysteria. Hysterical attacks simulating tetanus may also break out during pregnancy. I regard the following cases as belonging to this category. Dr. Richardson himself calls his case *puerperal hysteria*, Hervieux cites the two others as instances of tetany.

CASE LXII.—*Gauchet's second case.*¹ A milliner, thirty-two years old, married, was, in the eighth month of her fourth pregnancy, seized with irregular and intermittent contractions of the limbs, trismus, opisthotonos, spasm of the glottis, dyspnea, *loss of consciousness and sensation*. In some attacks she was in a *hypnotic state*. No albumen in the urine. At the full time she gave birth to a still-born child. There came a few attacks during parturition and after delivery. Her recovery was incomplete.

The unconsciousness, insensibility, and trance noticed in this history removes it from the domain of true tetanus, and seems to warrant me in assigning it a place among the hysterical cases.

In the following case it is expressly stated that the patient was hysterical.

CASE LXIII.—Sandras.² A multiparous, hysterical woman

¹ Hervieux, *l. c.*, p. 1,015.

² Hervieux, *l. c.*, p. 1,014.

suffered, in a new pregnancy, from continuous vomiting. After that she was taken with painful spasms of the right arm, followed by tetanic stiffness of the same arm and the left leg. This state continued till the end of the eighth month of her pregnancy (since when?) when a decided improvement took place, so that Sandras hoped the nervous disturbances would cease altogether after her delivery.

I have been unable to find the original communication,¹ but meagre as the details are, we notice that they differ from Trousseau's description of tetany by lack of symmetry in the parts affected.

The following two cases are very characteristic, and have been recognized as hysteric attacks by the physicians who observed them.

CASE LXIV.—W. L. Richardson,² of Boston. The patient was in the seventh month of pregnancy. No albumen in urine. One day she had eight convulsions in twenty-four hours. She first *turned over in her bed towards the wall*, as she said, in order not to fall out. Then with *low cries and moans* she would *throw her arms about*, grasping the head-board if her hands came in contact with it and *toss around in her bed*, her body bent backwards in opisthotonos. She would not answer when spoken to, and seemed to be wholly *unconscious*, putting her hand to her head and saying: "Oh, my head." After regaining consciousness she would say, "I had a very bad turn." The *abdomen was enormously distended*, forming a tumor from the breasts to the pubes, which went down to normal size when she was under the influence of ether. The following day she had a few convulsions; then she recovered, and had a normal labor at the full time.

Having italicized the words which contain the hysterical features, I do not think it necessary to enlarge more on the subject.

CASE LXV.—D. Webster Prentiss,³ of Washington, D. C. Mrs. M., 22 years old, in good health but intemperate habits, seven and a half months gone in her second pregnancy, was taken suddenly with screeching noise in the ears, and became blind and deaf. She was seized with tonic spasm of the flexor muscles of the arms and legs, recurring constantly for two hours. After one o'clock at night she slept quietly till morning.

2d day. She was taken again with spasms at nine o'clock in the morning, lasting two or three minutes, recurring every fifteen or twenty minutes, until one o'clock at night. Then she slept again

¹ Gazette des hôpitaux, 9 juillet, 1850.

² Boston Med. and Surg. Journ., vol. c., p. 157, 1879.

³ Amer. Journ. Med. Sc., vol. lxxviii., p. 451, Oct., 1879.

till morning. Bromide of potassium, gr. xx.; comp. spts. ether, fl. 3 iiss. every two hours, chloral in xx. gr. doses were given without effect.

3d day. The paroxysms returned at 8 A.M. with greater violence than ever. Opisthotonos so marked that only head and heels touched the bed. The jaws were clinched, the eyes closed. She was unconscious during the paroxysms, which lasted about four minutes, and passed off with prolonged holding of breath, succeeded by a deep-drawn sigh and complete relaxation. Chloral was given in xxx. gr. doses every two hours. She had two or three attacks with violent episthotonos up to 9 P.M. Then she slept quietly all night, and the spasms did not return any more. The patient was greatly debilitated, but recovery was uninterrupted. Labor did not supervene till the regular time.

The doctor based his diagnosis on the following points:

1. The attack was ushered in by noise in ears, deafness, and blindness. In tetanus the senses are sharpened.
2. She was unconscious during the paroxysms. In tetanus the intellect remains clear.
3. The eyes were closed. In tetanus they are wide open.
4. The patient slept all night. In tetanus she is kept awake by the painful spasms.

We might add that the spasms, although tetanic when they came on, had free intervals. In tetanus the contractions are permanent at least in part of the muscles and only interrupted by paroxysms of increased contraction.

I think the following case belongs likewise in the category of hysteric affections.

CASE LXVI.—Orlow.¹ A lady had in previous pregnancies suffered from *hemiplegia*, *loss of sensation* in hands and feet, trismus and convulsions. She was now in the fifth month of her thirteenth pregnancy when, without known cause, she was seized with trismus, stiffness of neck, and *loss of speech*. Chloral enema. Blister on neck, bromide of potassium. The contraction stopped on the fourth day, the speech returned on the eighth day.

In this case the contraction was continuous, but the loss of speech, together with her experiences in previous pregnancies, point toward its hysterical essence.

4.—*Tetanoid Convulsions due to Blood-poisoning.*

Finally I will give the outlines of a case which seems due to liver complaint.

¹ Petersburg Med. Wehnsch. Schmidt's Jahrb., vol. clxxxi., p. 240.

CASE LXVII.—Gauster.¹ Mrs. T., 31 years, married, suffering during the last seventeen years from frequent attacks of hyperemia of the liver with icterus, remittent and intermittent fever. When five months pregnant, she was thrown out of a sleigh in a snow storm. The next day she was seized with violent convulsions, impeding deglutition and respiration. Her head was hot, conjunctivæ injected, pupils contracted, pulse 100. With short intervals, tonic contractions appeared in the muscles of the neck, trismus, moderate opisthotonus; and in the arms, clonic convulsions alternating with tonic contractions. In the latter, the spasms were most frequent and scarcely interrupted three minutes. Temperature normal. No tumefaction of the spleen. No albumen or sugar in urine. Venesection (180 grammes), chloral (4 gms.), morphia acetate, 0.02 subcutaneously. This state continued for seven days. Then came a pause of three days. Then the convulsive state returned for three days more. After that she was free six weeks. Then again three days convulsions, followed by three weeks rest. Then came a final attack, accompanied by marked icterus. Five weeks later she had at term a normal delivery, excepting slight muscular contractions in the left arm.

III. TETANOID CONVULSIONS FROM LACTATION.

Trousseau² says that lactation is perhaps the most common cause of intermittent contractions or tetany. In a ward with only twelve beds reserved for nurses, he had observed more cases than in all the rest of his service.

The following case is the only one I have found in all the literature I have searched for materials to serve as a base for this paper, but then it presents the peculiarity of having occurred in five successive pregnancies.

CASE LXVIII.—Barbieri.³ The patient, 32 years old, robust, in good health, became afflicted with occasional painless twitchings in her feet and legs after having nursed her first child for some weeks. The child died when ten months old, and contemporaneously the twitchings ceased.

The next year she got her second child, and although it lived only seven days, the twitchings extended this time to thighs and loins. As soon as the milk secretion stopped, the mother recovered.

Thirteen months later the third child was born. The spasms returned as the milk began to flow, and recurred with increased violence every tenth day. On these occasions, *a fleeting tetanic*

¹ Schmidt's Jahrb., vol. clvii., p. 123.

² L. c., p. 145.

³ Ranking's Abstract, No. xix., p. 56, 1854, from Gaz. Med. Toscana, Jan. 3d, 1854.

spasm passed over her body, seizing one part after another, and never remaining in one place longer than four or five minutes at a time. On these occasions, there was considerable pain, the pulse and breathing were quickened, and the skin was drenched in perspiration. The paroxysm lasted from twelve to twenty-four hours, and then passed off without any consecutive fever. Bleeding, antispasmodics, purgatives, and valerianate of quinine were tried in vain, but when the child died, ten months old, the spasms ceased with the flow of milk.

Similar spasms returned in the two next confinements, and weaning was found to be the only remedy. This afforded immediate and complete relief.

Thus all the cases on record of tetanoid contractions during pregnancy and lactation, differ somewhat in character from true tetanus, especially by their intermittent or hysterical character, but some of them were grave enough to cause the patient's death.

As to treatment, bleeding is contraindicated in those cases which are attributable to lactation or hysteria, and ought only exceptionally to be performed during pregnancy. Antispasmodics, especially chloral and bromide of potassium in large doses, seem to meet the chief indications.

C.—TETANOID CONTRACTIONS DURING PREGNANCY.

NO.	PHYSICIAN.	AGE.	NUMBER OF PREGNANCY.	MONTH OF PREGNANCY.	CHARACTER.	RESULT.	DURATION.	ETIOLOGY.	TEMPERATURE.	URINE.	TREATMENT.	REFERENCES.
58	Mikschick....	16	1	8th	Intermittent, began in extremities.	Died	18d'ys	Unknown cause.	Normal	No albumen	Leeches, chloroform.	Wochbl. d. Ztschr. d. Gesells. d. Aer. zu Wien, No. 33, 1855. Br. & For. Med.-Ch. Rev., vol. xviii., p. 209, 1856.
59	T. Curtis Smith, Middleport, O.	..	4	day before part'n term	Inter. opisthot., spasm brought on by touch or noise.	"	8 hrs	Invalid passing years in bed.	.....	.....	Opium, stimulants.	Philad. Med. & Surg. Reporter, vol. xxix., p. 203, 1873.
60	James Collins, Philadelphia.	...	...	during 1st st. term	Intermittent, all symptoms of tetanus.	"	4 days	No apparent cause.	.....	.....	Morph., bromide potass., chloral, amyl nitrite	Ibid., vol. xxxvi., p. 129, 1877.
61	Gauchet	33	...	7th	Interm., began in extremities, trismus.	recov.	6 wks	.....	.....	.....	.....	Hervieux, l. c., p. 1,014.
62	Gauchet	32	4	8th	Interm., began in extremities, trismus, opist., insensibility.	"	over a mo'th	.....	.....	No albumen	.....	Ibidem, p. 1,015.
63	Sandras .....	...	m'l- tip'r	...	Asymmetric....	.....	.....	Hysteria.....	.....	.....	.....	Ibidem, p. 1,014.

C.—TETANOID CONTRACTIONS DURING PREGNANCY.—Continued.

NO.	PHYSICIAN.	AGE.	NUMBER OF PREGNANCY.	MONTH OF PREGNANCY.	CHARACTER.	RESULT.	DURATION.	ETIOLOGY.	TEMPERATURE.	URINE.	TREATMENT.	REFERENCES.
64	W. L. Richardson, Bost.	.....	.....	7th	Intern., unconscious, phantom tumor	.....	.....	Hysteria.....	.....	No albumen	.....	Bost. Med. & Surg. Jour., vol. c., p. 157, 1879.
65	O. W. Prentiss, Wash'n, D. C.	.....	.....	.....	Inter., deaf and blind, unconscious.	recov.	.....	Hysteria.....	.....	.....	Bromide of pot., co. spts. ether, chloral.	Am. Jour. Med. Sc., vol. lxxviii., p. 451, Oct., '79.
66	Orlow .....	.....	13	5th	Trismus, loss of speech.	"	4 days	Hysteria.....	.....	.....	Chloral euena, blister, potass bromide.	Schmidt's Jahrb., clxxxi., p. 240.
67	Gauster	31	.....	5th	Intermitt., long intervals.	"	3 mos	Liver complaint, icterus.	normal	No albumen	Bleeding, morphia subcutaneously.	Schmidt's Jahrb., clvii., p. 123.

D.—TETANOID CONTRACTIONS DURING LACTATION.

68	Barbieri	32	1st five	Fleeting	recov.	until 10 mos	Lactation	Bleeding, anti-spasmodics, purgatives, quinia valerianate, weaning.	Ranking's Abstr., No. xix., p. 56, 1854.

THE USE OF HOT-WATER INJECTIONS IN UTERINE DISEASE.

BY

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THE early use of vaginal injections indicates the necessity for their application. Hippocrates was not ignorant of them. The conditions which we find in the treatment of uterine disease are such often as follow perversion of function; indeed, this by many has been looked upon as the germ of such diseases. The circulation is under the control of that system which is the cause of menstruation. As a consequence, we have congestion, arterial pressure, and in the very anatomy of the womb, we have a peculiar arrangement of the blood-vessels; the uterine artery, with the return vein, passes through and underneath the constrictor muscle of the cervix; there is a tension of the vascular system; if there is a loss of tone, there will be congestion. Disturbed innervation of blood vessels leads to vascularity; irritation produces hypervascularity; there is an increase of blood pressure; arteries enlarge in location of inflammation. Lawrence found that blood would run more rapidly from an arm inflamed than from one that was not. The pathological condition of the womb has in a marked degree as an etiological base a fulness of the vessels, an exaltation of the nervous power, together with disturbances of the circulation, which are but sequences in the train that follows after that point of congestion, which has been aptly termed a nerve turmoil. The uterus is the centre of fluxion; its body tapped at any one point may draw blood from the whole organ. The process of gestation has a powerful influence in the production of disease; the womb during this period is in a state of vital erection. The traumatic injuries, by the function of parturition illy performed, opens before us a Pandora-box of ills. Next, the process of fatty degeneration, lowered vitality; this repairing, this removal of waste material is not free from danger. The condition of involution is productive of disease; the decrease as well as the increase of the womb; the increased vascular supply—that state of uterine nutrition, the

finest field opened for study, a nutrition which often runs wild. All these states have the same pathological tendencies, the same diseased tendencies, the same bearing towards an increased vascular supply, which, if uncontrolled, terminates in disease. Add to this the productive causes—the dancing, the theatre-going, the languid reader of novels, whose ovarian brain is stimulated at the expense of the cerebrum. Take the rich, where consumption of time is their chief occupation, or the poor, on the other hand, whose hands and feet must make for them a livelihood, sitting constrained at needle-work, standing fatigued in the shop, at the wash-tub, or in front of the cooking stove, with hips overheated, doing all things which tend to produce pelvic congestion. Is it to be wondered at that the womb becomes diseased, even in so many ways as to have caused the remark from old Dr. Hodge, that if the womb is subject to so many ills, what a pity it is that a woman has a womb. Now then, in dysmenorrhea, pelvic pain, increase of vascular congestion, hypersecretion, endocervicitis, endometritis—for anything which produces a stasis of blood produces endometritis—laceration of the cervix, with all its ills, cystic hypertrophy, uterine engorgement, arteries taking in more blood than can be returned by the veins, with it sequent catarrh, not to speak of peri-uterine inflammatory conditions—all these things call for some power of relief, something which will hold until nature, science, and art can come to renew, to restore. Now, what is the best influence we can bring to bear under such circumstances? Let us as gynecologists do what others do under like conditions. The maniac is restrained until time is given for other influences to work; it makes no difference whether he is restrained by camisole or chloral, the result is the same, he is restrained from doing harm. The fractured femur, we are told by Sayre, if treated in time by plaster of Paris, will not be followed by swelling of the injured limb. Air-pressure, nature's splint, relieves the Eustachian tube, consequently the aurist blows out with a Politzer's bag the occluding secretion to let in the air; the dry treatment in diseases of the ear, or what Spencer well terms the mechanical, is one that rests on pressure. The oculist holds the iris with atropia and meets inflammation with astringents. The laryngoscopist uses astringents and caustics. The

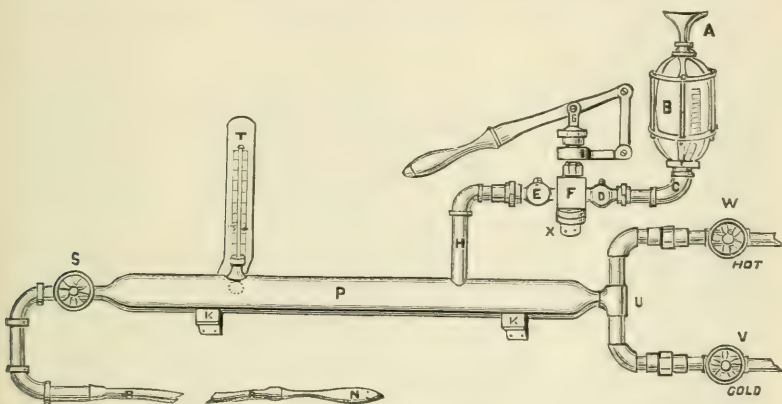
general practitioner places a bandage over the chest in pneumonia and puts the bowels in opium splints in peritonitis. Doctor "Quiet" has always held in our profession the position he obtained in the old school of Salernum. Nature exerts a pressure in health which keeps the fundus of the womb at rest by placing the constrictor oris et cervicis muscle of Bucklin at the cervix uteri, and running underneath it the uterine vessels, lymphatics, and nerves; it forms the governor or regulator. Rest, pressure, and the use of absorbents mark well our line to meet local inflammatory action. Now what means have we of putting the womb at rest, of producing contraction, of making pressure, of lessening the supply of blood, of breaking the sentence of ubi irritatio, as it refers to uterine disorders, by preventing the usual sequence of ibi flexus, and if it does occur, then obviating its doing any damage by putting the organ at rest, by pressing out the disturbing element, and so fixing the avenues as to prevent its re-admission, so that it cannot enter again and grow by accretion. We want something to hold the circulation until we can repair broken walls, until we can place the organ on such a high plane that neither intrinsic nor extrinsic causes can produce an effect upon the nervous system, so as to engender congestion, so as to produce a gorged vascular condition, a congestion which means a dilatation of the blood-vessels. The power of producing the contraction of the circulation of an organ meets nowhere such an apt field as at the cervix of the womb; for here are all the entering and returning vessels of the uterus, every kind of nerve is included in this utero-vaginal tract. True, the fundus and cervix are divided just as the cerebrum and cerebellum, but at the same time there is a sympathy between them; irritation at the cervix produces in the body contractility and retractility. There is no power which will so conveniently and so well perform the requirement of contraction of the vessels of the womb as heat, that property of matter concerned in the sensation. Heat should be applied at a temperature higher than that of the body, yet not high enough to produce tissue damage, never under 100° F., nor higher than 120° F.; it should be applied during a long period, and so frequently as not to allow the contractile power to cease in the interval. Heat applied to the cervix is a stimulant, and will excite the

respiration and pulse; it will produce contractility, and is the best of the three methods we have of causing reflex contractility. The contraction produced by it is permanent.

Heat to the cervix uteri produces not only local effect, but has its action on the blood-vessels of the fundus as well as that of the whole pelvic viscera and the general circulation. Heat is an alterative, causing absorption in subinvolution and hyperplasia of the uterus. Emmet says heat first relaxes the capillaries, the tissues swell, then reflex action taking place, the vessels contract, and the tissues shrink. The nutrition is not interfered with; the reaction from heat, therefore, is contraction. In hemorrhages from the womb, heat is the most reliable means of arrest; it acts, as a late writer expresses it, by throwing muscular fibres of the uterus into tetanic spasms. Heat has been applied in various ways. Sand-bags have been used, Fuller's earth hot and moulded, rubber bags filled with hot water; but water alone is the best medium, administered in the form of an injection; in addition to its power of retaining heat, medicaments can be added to it. Scanzoni made an advance in the right direction when he first recommended that the injection should be frequently employed, and for some duration; it should have a steady pressure, and be given with some force. I am convinced that Emmet is right in stating that the jet acts as a stimulus to excite the blood-vessels to contract. While using the injection, the patient should lie in a recumbent position, and the temperature of the liquid should be exactly marked by a thermometer. For the administration of injections, the old bladder and pipe have long since passed into oblivion, and even now the profession do not sufficiently instruct their patients as to what constitutes a proper injection.

The small piston syringe is a delusion for vaginal purposes; as well apply water with a tea-spoon in endeavoring to quench a large conflagration. The Davidson syringe, as used under the direction laid down by Dr. Emmet, is the best; the objection to it is the fatigue; if you desire to develop what are called in secret society parlance the grip muscles, or if you desire to know what muscular fatigue is, try the use of this syringe by injecting two gallons of hot water three times a day into the vagina. Next come the irrigator, the siphon and

fountain syringe; all these have their peculiar adaptation and their especial objection. Finding the difficulty in a woman's hospital to get just the syringe needed, being an advocate of long-continued, thorough hot-water injections, I beg to call attention to a douche which I have devised. The power is supplied by the city reservoir or the house tank; this fills as far



Schenck's Vaginal Douche.

- A, the funnel-shaped mouth through which medicine is poured.
- B, the glass vessel for the liquid medicine; it is graduated into drachms and ounces, and is held by metal frame.
- C, pipe connecting medicine-holder with pump.
- D is the suction valve.
- E is the forcing valve.
- F, the pump.
- G, piston of pump; each downward movement of this piston throws the amount of liquid between valves D and E into pipe H, and each upward movement draws an equal amount by valve D from glass vessel B.
- H, connecting pipe between forcing or ejecting valve E and common pipe P.
- K, brackets holding main pipe.
- N, vaginal pipe.
- P, main pipe where hot and cold water are united; the temperature is taken, and the medicament is thrown in from H.
- R, rubber tubing fastened to pipe, connected to P and to which vaginal pipe N is attached.
- S, valve to shut off water from main pipe.
- T, thermometer with bulb in pipe P, the arrow on thermometer to indicate 105° F.
- U is union between main pipe with hot and cold water pipe.
- V, cold water pipe with valve.
- W, hot water pipe with valve.
- X, bracket to support pump F.

as possible all the requirements of a fixed apparatus for a complete vaginal injection. I have extensively used it during the past two years, with the most gratifying results. The administration of vaginal injections has become to the patient a pleasure instead of an annoyance; no case of uterine colic has

occurred from its use. The nurse is freed from the severe labor, which, many times, I am satisfied, she imperfectly performs.

The apparatus is placed against the wall of the bath-room, and may be inclosed in a suitable case. I use also a light movable frame, which placed over the bath tub has a proper inclination, and is so arranged that the patient can, lying upon it, take the injection without incommoding herself or soiling her clothing.

It has been urged that hot-water injections are injurious. There have been reported cases (some of them fatal) of uterine colic, but they are very rare. In all such cases, there was either a lacerated condition of the cervix or a displacement, usually a retroflexion. The colic gives the same symptoms (sudden pain, sickness, coldness of extremities) as are observed after catheterization of the bladder or injections into the urethra. It is a question whether this shock is not caused by the entry of air. Olshausen, Depaul, and Litzmann have shown that there is such a thing as entry of air into the veins of the pregnant uterus, and Stofella showed that it entered into a vaginal vein which had been eroded by carcinoma; but these accidents, as suggested by Ebell, can be obviated by using vaginal tubes with only side openings. It is charged that injections of hot water light up afresh or rekindle an old pelvic inflammation. Voisin states that inflammatory collections in the neighborhood of the uterus are irritated through stretching of the vagina; but this is a pure matter of imagination, for, as Mundé says, no such instance was ever reported. In conclusion, hot-water injections are not our only means of treating uterine disease; but as an adjuvant abandon them not—their failure is the want of proper application. With all our using, let us use hot-water injections.

THE PROPER TIME TO REMOVE THE PLACENTA WITH
REFERENCE TO THE PREVENTION OF POST-PARTUM
HEMORRHAGE.

BY

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DISCARDING at the outset both the let-alone method and Credé's method of expression *per se*, it is proper to consider some points material to the proper understanding of the forces that Nature employs in effecting the expulsion of the placenta. At full term, when Nature has cast the fruit of the womb, let us note the processes she employs in bringing about the second delivery. What are the conditions present immediately after the expulsion of the fetus? Before answering this query, it would be proper to state that the fetal circulation is a collateral one—a physiological diversion from the maternal circulation; and when the fruit of the womb is expelled, then this collateral diversion or fetal circulation is suddenly shut off: thereby for a time the tension of the maternal vascular system is greatly increased, and consequently the liability to hemorrhage, as the circulation must return to its primitive channels which occupy a lessened area, confined within and limited to the maternal vessels. Simultaneously with the establishment of respiration in the child and the ligation of the cord, coagulation commences, and within a few minutes is completed, in both the cord and placenta. Upon the completion of placental coagulation, separation normally begins, as indicated by post-partum uterine contractions. In a perfectly natural labor, the coagulation process is completed ere Nature is prepared to safely part with the placenta, or even manifests a disposition to expel it, and, in fact, the formation and presence of coagula—first in the placenta and then in the uterine sinuses—are the very agents that normally excite uterine contractions, and thus effect the expulsion of the placenta. To attempt the removal of the placenta from a lax, exhausted uterus, by force or otherwise, when it is in a state of physiological inertia, and consequently has neither the power to resist forcible detachment

nor to contract after its removal to prevent hemorrhage, only betrays ignorance of a physiological function which, *uninterfered with* in the lower animals by obstetric art, abundantly secures immunity against post-partum hemorrhage. When Nature is adequate to the work, it is unjustifiable, nay, even reprehensible, to substitute artificial means in place of the natural function. It is the province of the obstetrician to judiciously aid Nature in effecting her work, but never to wholly ignore her powers by the substitution of art. The maternal circulation, cut off from the fetal, still seeks its accustomed outlet, but soon finds its way blocked with coagula, and now, with each additional arterial impulse, the uterine function is stimulated into renewed activity—the blood of the mother, now no longer drawn upon to nourish the fetus, is directed to a new purpose—the stimulation of the uterine tissue. Thus, a few moments ago the passage of arterial blood through the uterine sinuses was a *sine qua non* to the welfare of the fetus; but now, after its expulsion, the safety of the mother absolutely demands its immediate arrest and abrogation, and this is rendered possible only by the presence of a well-devised and perfectly coapted tampon, the placenta, till the completion of the process of accommodation. Thus, it is readily seen that the arterial impulse may cause the patient's death if the placenta be prematurely removed; or, on the other hand, it may prove her salvation in the stimulation of the uterine tissues to contraction.

An important practical question now comes up: How long a time does the immediate, as well as the future, welfare of the parturient woman require that we should wait for the normal separation of the placenta? Shall it be forcibly separated from its attachments immediately after the expulsion of the fetus by a *vis a tergo*, as by Credé's method, or drawn out by a *vis a fronte*, at a time when the uterus, functionally oblivious to all manipulations, has lapsed into the profound repose of physiological inertia? Or shall we wait for the resumption of labor till Nature has put all her forces on guard, and prepared for the event by occluding the sinuses with coagula? Unless the placenta has been expressed or squeezed out immediately after the expulsion of the fetus, when Nature could offer no resistance nor have a voice in the matter, you will have to wait a while till the process of coagulation is completed or nearly so,

when Nature is ready and fully prepared to part with, and able to expel a now useless safeguard. As to how long we should wait no definite limit can be set, as each case is a law unto itself; but unless there should be partial separation of the placenta, as indicated by hemorrhage or some other special condition, all active interference should be delayed from ten minutes to two or more hours. But in a large majority of instances Nature is ready to respond to and second our efforts of gentle expression and kneading in from ten to twenty minutes, as coagulation is usually completed within that period. It matters not with what facility the dexterous manipulator may express or squeeze out the placenta; it is no criterion that it is a salutary proceeding, but that it is unscientific and at variance with the parturient functions is susceptible of demonstration. If the placenta be expressed immediately after the expulsion of the fetus, and the hand of the operator be inserted within the uterus, he can readily verify the assertion that the womb, during its contractions, simulates and describes the various flexions, varying in direction, of course, according to the site of the placental attachment; and, further, that it does not contract promptly, efficiently, and uniformly, and, hence, there is developed a tendency to perpetuate these flexions, which obviously interfere with the rapid and normal process of involution. But let the uterine sinuses be filled with coagula, thus maintaining the uniform thickness of the uterine walls, then the after-pains or post-partum contractions rhythmically and continuously carry forward the process of involution to early and final completion. How significant and instructive the fact that it is far easier to *express* or *remove* the placenta immediately after the expulsion of the fetus than it is a few minutes later! How easy to invade the womb during the physiological inertia and rob it of its safeguard, the placental tampon! Can any rush of professional engagements justify the hasty disposition of the parturient woman? Are the issues of life to be so lightly dealt with, often entailing lasting uterine ailments and even jeopardizing life? Can we not well afford to wait on Nature till the process of accommodation is completed—till coagulation has prepared for *the event of separation*, and the placenta is about ready to fall away from its attachments and be expelled as naturally as would be the hand or any other foreign body?

Playfair states "that the one great primary cause of post-

partum hemorrhage is *inertia*." T. More Madden (in AM. JOURN. OF OBSTET., April, 1882) asserts that sixty-five per cent of the cases of post-partum hemorrhages *are due to inertia*, and that twenty-five per cent of these are due to *irregular* contraction. Playfair further states "that, among the secondary causes, *exhaustion* is the most frequent;" and next in order, both Playfair and Simpson place *irregular* contraction; thus substantially agreeing with the foregoing statement of T. More Madden. Is it a tenable position to state that we have *inertia* unless there are efficient contractions within from ten to twenty minutes? Physiological inertia or rest after the exhaustion of labor may last for a period varying from a few moments to two hours or more without necessarily exciting apprehension, if it be unattended by hemorrhage or any special symptoms of serious import. It would be a grave error to mistake physiological inertia or the repose of exhaustion for the pathological condition, and precipitately remove Nature's blockade—the placental tampon—thus opening the flood-gates, and leaving Nature powerless to close them. To what cause, then, is *irregular* contraction due? Primarily to the absence of coagula in the uterine sinuses. If the uterine sinuses be occluded with coagula, the walls of the hypertrophied uterus preserve a uniformity of thickness, which is essential to uniformity of contraction; but, in the absence of coagula, the placental site is left relatively or abnormally thin, and when contraction sets up, whether superinduced by kneading or ergot, it is irregular, and a veritable flexion takes place under each contraction. And may not this condition thus set up be perpetuated, and subinvolution result as a sequence? It is a noteworthy fact that, contemporaneously with the general use of ergot as an oxytocic, and also the general adoption of the hasty methods of expression, there has been a notable increase of female disease.

In conclusion, I would state that if there is no partial separation of placenta, as indicated by hemorrhage, and the lying-in woman be resting well, let her alone; exempt her from officious kneading, expression, etc., till coagulation is completed; wait till both the presence of coagula and the *relative* increase of arterial supply stimulate the uterine tissue into normal contraction. Then *retained* and *adherent* placenta and *inertia* will become phenomenal complications.

THE CARE OF THE PUERPERAL BREAST.

BY

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IF we were to judge by the cursory treatment that the care of the puerperal breast receives at the hands of the majority of our standard obstetric writers, we would be forced to infer that the subject was either one of great simplicity, or a matter of indifference, or else that slight practical knowledge is enjoyed by the profession on this important subject.

It is striking, on reviewing the literature of obstetrics, to find how much space is devoted to the major operations, and many other matters with which it is unusual for the general practitioner to come into personal contact, and how little attention is given to the treatment of sore breast, with which he may be harassed almost daily; while anything like special recommendations for improving the quality, or increasing the quantity of milk secreted are not to be found.

Is not the overweening prominence given to the dramatic in obstetrics responsible for this? For many obstetricians who show great skill, in even the most heroic operative midwifery, confess to ignorance of any but routine measures for threatened mammary trouble, while there are, unfortunately, some who regard the care of the puerperal breast, as occupying a position so lowly, as to be naturally relegated to that domain in which the nurse reigns supreme.

The great importance, both to mother and child, of a healthy, well-developed, and functionally perfect breast, can hardly be exaggerated. It is needless to more than mention here, the influence for good the healthy activity of the breast exercises on the convalescence of the mother; the pleasure and satisfaction she derives therefrom; and lastly, the moral influence it has in developing the maternal instincts and affections as nothing else will. On the other hand, it is difficult for us to appreciate the amount of moral suffering some delicately organized and affectionate mothers endure when it becomes imperative

to surrender their children to the care of another. Because she is unable to perform this most maternal of duties, she is, by that, much the more desirous of so doing, and the annoyance and jealousy she feels, are hindrances to her convalescence, while they, at the same time, produce a lasting effect on her character. The physical pain and local evils which result from a fissured nipple or inflamed breast, and the attendant danger and disfigurement, will be considered later on.

The mother's interests are insignificant, however, when compared with those of the child. Consider, for instance, the deaths among children caused by improper care of the maternal breast, whereby the nutrient source, nature designed for their sustenance and growth, is impaired in quality, diminished in quantity, or entirely cut off. Among the poorer classes, the resulting evils are simply incalculable. The sad results obtained from exclusive hand-feeding, when directed by ignorance, and combined with bad hygiene, are so well known as to have nearly lost their power to impress us with their full significance.

Among the more wealthy, the deprivation of the mother's milk is not so dire an evil, as among the poorer classes; for, here, we can provide a wet-nurse, the only admissible substitute where it can be obtained. Even with a wet-nurse, however, it is not unusual to find that her milk is inferior to that of the mother, for nourishing an infant whose whole life has been spent in its mother's body, and whose tissues are in sympathy with those from which they sprung and have derived their nourishment for nine months. As so close a functional relationship exists between the uterus and breasts, the special force of this factor is rendered greater. I have seen many cases, where the milk of the mother appeared under the microscope and in the test-tube less fitted for nutrition than that of the wet-nurse; but, notwithstanding this, the child thrived best on that food nature had intended for it. We do not have to seek far for an explanation of this seeming paradox. I think it is made plain by considering the following well-established fact in physiology. We know from chemical and microscopical examinations of specimens of milk, secreted at different intervals from the same breast, that the milk undergoes progressive changes, from the colostrum present before

birth to the fully perfected milk, secreted at about the fourth or fifth week. The development of the secretion is therefore synchronous with that of the child. Nature has here pointed out to us the need, not only of a perfect puerperal, but of a perfect maternal breast, for the highest development and most perfect health of the child. The simple preservation of life is only a partial good. What we should aim to attain for the child from the moment of its birth is perfect nutrition and favorable environment, that its tissues may be developed up to so high a plane as to be able to resist inherited diathetic tendencies, and to be but little influenced by untoward influences from without. It is doubtful if we can provide any substitute for the mother's breast milk which will enable us to achieve this high ideal of tissue nutrition. In view of these facts, the inestimable importance of the perfect structural and functional development of the puerperal breast needs but to be mentioned to be appreciated.

The mammary glands, which, by their location and shape, form the ornaments of the sex, and by their function serve for the sustenance of the race during the most important year of our lives, are the organs, then, whose highest development we are aiming to have achieved, and whose preservation we desire secured. The apparatus for the formation, retention, and discharge of the milk consists of the mammary gland and nipple. The gland is of the compound racemose type. The lobes into which it divides have each a separate excretory duct, and are inclosed in distinct loculi, separated from each other by fibro-cellular partitions loaded with fat. The lobes divide into smaller ones, and finally subdivide into ultimate lobules. The lobules are fibro-cellular pouches, having a diameter of from ten to twenty times that of the capillaries which surround them, and are lined with short columnar epithelium. The milk is formed by the action of these cells, and after its secretion passes into the lacteal ducts, which are small tubes composed of cellular, with a small amount of elastic tissue, and are lined with short columnar epithelium. The smaller ducts unite as they converge toward the areola, before reaching which, they usually join to form a single excretory duct for that lobe from which they were derived. Directly beneath the areola, they become dilated to form ampullæ or sinuses, which, as well as

the larger milk tubes, have some muscular tissue of the unstriated variety, in addition to the areolar and elastic tissue they possess in common with the smaller ducts. These sinuses become dilated during lactation, when they serve as temporary reservoirs for the milk during the intervals of suckling. They possess considerable pathological interest, as we shall see directly. The lacteal canals again contract, between the sinuses and the centre of the base of the nipple, on reaching which, they ascend separately to its apex, where they terminate at the bottom of an equal number of small, cup-shaped depressions. These external openings are smaller in diameter than the milk-ducts, and it is not improbable that they have more or less of a sphincteric power, although this has, as yet, never been certainly demonstrated. We have in the sinuses, with the tubes leading into and from them, a system of syringes, acting as so many miniature pumps, to propel the milk through the ducts, and cause its ejection. They are capable of thus propelling the milk, owing to the muscular fibres they possess.

The entire gland is inclosed in a fibro-areolar pocket with an opening corresponding to the implantation of the nipple. This pocket is in intimate relation, in front, with the skin covering the breast, while behind, it is bound to the pectoral muscles by somewhat loose areolar tissue. The bulk of the breast is adipose tissue, to the presence of which the gland owes its smoothly rounded form.

The nipple consists externally of a cutaneous pouch, more or less deeply pigmented, which is studded with sensitive papillæ. In its centre the nipple is, as already mentioned, traversed by the lacteal ducts. Between these two there is a large amount of vascular and fibro-areolar tissue, which render suckling mechanically possible, by the firmness and toughness they impart to the nipple. The nipple at its base is surrounded by a ring of plain muscular fibres, while a few irregular bands pass towards its apex. It is mainly owing to these muscular fibres that the nipple is capable of becoming protuberant and firm; because it was possessed of this property it was formerly reckoned as containing erectile tissue. The areola, which surrounds the base of the nipple, is also pigmented and contains a number of small glands, which secrete a thick oleaginous substance, serving to a certain extent to lubricate the nipple

during suckling. The subcutaneous fat is absent beneath the areola, which is quite closely joined to the connective-tissue sac embracing the gland. The breast and nipple are abundantly supplied with lymphatics; and nerves, from both the sympathetic and cerebro-spinal systems.

The secretion of milk results from the metabolic activity of the epithelial cells lining the lobules. The three great food principles present, viz., proteid, represented by the caseine; fatty, present as butter; and lastly, the carbo-hydrate, in the form of sugar, are all formed from that comprehensive substance, protoplasm, present in the blood. I have thought it best to go over, thus in outline, the anatomical picture of the organ we are considering, in order to facilitate the description of its pathology and surgical treatment; while I have introduced the more advanced physiological views, that the correct dietetics of lactation may be understood—an important subject, which is misapprehended by many scientific practitioners. In dealing with the puerperal breast, the following indications may present themselves for treatment:

- (1.) A deficient secretion of milk.
- (2.) A secretion of impaired quality.
- (3.) An excessive or retained secretion.
- (4.) An obstruction to the removal of the fluid.
- (5.) Galactoceles.
- (6.) Inflammations.
- (7.) Mammalgia.
- (8.) Affections of the nipple.

A *deficient secretion* may be due to lack of mammary development, or to structural alterations having impaired the anatomy of the glands. It is liable to be encountered at either extreme of age. If these conditions are not present, it will be usually found to result from impaired constitutional vigor, or from a local want of tone. Preparatory treatment, from early pregnancy, will naturally diminish this large and rapidly growing class. And, in many cases, where prior pregnancies have been attended with a scant supply, we may thus insure a sufficiency of good milk.

In preparing the system for the work of lactation, a common error has arisen and gained possession of the mind of the profession, from the supposition that the system should be sur-

charged with fat, in order that the gland might draw upon the accumulated supply during the period of suckling. By many, it was supposed, that the epithelium lining the lobules allowed fat circulating in the blood to pass through by a species of osmosis, and that, therefore, the presence of butter in milk is due to mechanical, rather than vital cell activity. Under the shadow of this theory, those articles of diet rich in carbon have been selected and given the mother during pregnancy. Physiology has shown us, however, that the metabolic activity of all tissue is lessened by fatty food, while it is equally well established, that, to obtain the highest functional activity of a gland, we must present a pre-eminently proteid dietary. These facts are notably true with reference to the puerperal breast which is a metabolic tissue par excellence. The excessive deposition of fat, often seen in women who have been treated with this special object in view, is indeed deceiving. With what anticipations of successful lactation the mother regards her massive breasts. The medical attendant often shares her views, forgetting that not only is the subcutaneous fat present in increased quantity, but that also, the areolar tissue dipping between the lobes of the mammary gland is necessarily loaded with fat, and by the pressure it exerts, mechanically shuts off more or less of the blood which circulates around the glandular epithelium. The pressure on the gland-tissue also undoubtedly lessens the power of secretion, while the compression of the milk-ducts and acini interferes to a considerable extent with its easy exit.

Our general measures for increasing the flow of milk are, therefore, those constitutional means which have the power of increasing glandular activity, and are, (*a*) a dietary presenting an excess of the nitrogenous food principles, which has been already pointed out, combined with which should be, (*b*) systematic exercise, regularly taken; this being useful for determining nutritive changes and preventing an excessive laying on of fat. Certain medicines are claimed to specifically increase the secretion of milk. They are as fallible as they are numerous. I am free to confess that I have never seen an increase of milk result from any drug, topically applied or internally administered. Certain systemic tonics, as iron, etc., are often useful for improving the general nutrition, but increase

the secretion of milk only indirectly. To improve the local tone and nutrition of the mammary gland, skilful massage proves most useful, if begun in the early months of pregnancy. Few patients, however, will be found willing to endure this annoyance. As a substitute we may instruct the patient herself, and, by a little practice, many of them become skilful enough to accomplish all that can be desired. Night and morning she is to employ the following manœuvre, first raise the gland from the chest-wall by the edges of the bands applied at the inner and outer sides of the breast, then apply the palms of the hands to the convexity of the breast and sweep them upwards to the nipple. This is to alternate with rolling the breast between the palms of the hands and gentle friction applied to the skin covering and adjacent to it. The nipple should receive special attention, for by friction alone, independent of the more efficient means to be described, we can render it prominent and firm, while the skin covering may be made so tough and insensitive, as to stand hard usage, or even positive abuse, during the entire period of lactation, without harm resulting. In applying massage to the nipple, the manipulations usually recommended are efficient. First sweep the bulb of the index finger over the areola, until the nipple is made prominent, when it is to be seized between the thumb and index finger, and dragged forward in imitation of the movement which the child is to perform. It is at the same time to be pinched and rolled so as to toughen it as much as possible. If the nipples are thus rendered prominent, and care be taken to prevent the clothing depressing them, when the milk is secreted, it will find pervious ducts to traverse. If the nipple be depressed, the angle at which the tubes are thus bent prevents the easy escape of the milk. If this have lasted for some time, the larger ducts, and in some instances the sinuses, become permanently occluded. This of course greatly cripples, and in some instances, may destroy the gland's power of secretion.

If the means recommended for improving the local tone of the breast be faithfully employed, in connection with the general measures referred to, many infants' lives may be saved, and much maternal suffering prevented.

When the milk begins to fall off during lactation, the best

hygiene, a change of air if possible, nitrogenous food, regular but infrequent periods for nursing, and supplementing the scant secretion by hand-feeding, will do all we are capable of doing, for this very important and annoying complication. The best diet is milk in as large quantities as can be digested. Butter-milk should be employed if practicable, as the removal of so large an amount of fat renders it better for our present purpose. Meat, fish, and eggs are to be partaken of freely; while stimulants are to be used with caution, but not of necessity interdicted entirely.

The milk most often diminishes or ceases altogether during a rise in the mother's temperature, owing to transient septic poisoning, intestinal disturbance, or other trouble; so that it behooves us to keep a nursing woman's health up to the highest standard, and to guard her from the numerous malign influences which beset the path of a puerperal convalescent.

The first few days are all-important. The infant should be applied to the breast, as soon after its delivery, as the mother is made comfortable; for the nipple is thus drawn out, and a determination of blood to the breast occurs.

It is usually best to apply the child two or three times daily, until the flow of milk is well established. The small amount of laxative colostrum the child gets is what nature intended for it; otherwise, the mother would have had fully formed milk for it at its birth. The child needs nothing from any source whatever, until its mother has elaborated its food in her breast, providing always the mother have a normally-acting mammary gland. The custom of giving cow's milk, sugar and milk, or, worst of all, barley-water, before the secretion is fully established, cannot be too severely censured.

The child who has had milk poured down its throat, or has only had to abstract it from a nursing-bottle against the influence of gravity, does not take kindly to the mother's supply, which he has to struggle at valiantly, and then, at first, gets but little to appease his hunger. If we have an infant always at hand to greedily empty a breast, but little trouble from over-distention is to be feared. We can be certain that where nursing is fairly hard work, the infant will not glut himself, and lay a foundation for later intestinal troubles. I have tried giving new-born infants nothing excepting what they could obtain

from the mother's breast, and find it to work admirably. This I have tried in a large number of cases, and was at first surprised to see how well they bore their enforced fast, if it could be so called. Excepting when put to the breast, they slept the greater part of the time, and were always phenomenally still.

After the secretion is well established, during the first month, the infant should be nursed at intervals of about three hours during the day, and double that period at night. The breast, like any other organ, is subject to habit, and one accustomed to regular periods of suckling causes far less trouble, and does much more, and better work, than another which is used as a placebo for the crying infant at first, until it enslaves parent and child, and may impair the health of both. The periods between suckling should be lengthened as the child ages, but their regularity should not be broken. So much, then, for a deficient secretion, and the means for preventing and correcting it.

The second class of cases we come to consider, are those in which the *milk is of so poor a quality*, as to be unable to support the child in perfect health. The means already advised for increasing the quantity of milk are here to be likewise employed. A successful issue is hard to obtain. If the poverty of the milk result from excessive secretion, some of the measures recommended in the next paragraph should be tried, and may meet with a certain degree of success. If our resources fail, we should employ in part cow's milk, properly prepared, to supply the necessary complement of nourishment. Children thrive fairly well on this combination, and the rest given the system and the breast often enable a richer quality of milk to be subsequently secreted.

The increasing poverty of the milk without apparent local cause is not infrequently nature's way of closing an account which is being overdrawn. In such a case, impairment of the quality of the milk conserves to the mother's good, and we should rather encourage the cessation of the secretion, than try and arouse the gland to renewed efforts, to the detriment of the mother's health.

The *secretion of milk may be over-abundant* from general plethora. These cases usually yield readily to gentle purga-

tion and restricted diet; while in some an evaporating lotion needs to be locally applied. I have never found the administration of the iodide of potash necessary. The most common cause of hyper-secretion, is a relaxed state of the tissues in general, and of those of the mammary gland particularly. This causes a passive transudation of the plasma of the blood through the epithelial cells lining the acini, and allows of its escape; a small proportion, relatively, of the albumen having been changed into casein, fat, and sugar. This condition tends to become worse, until the mother may be greatly exhausted by the constant drain maintained upon her blood. When this state obtains, it is aptly called galactorrhea.

Another disturbance of excretion we will consider here. In this form, the milk may be of normal composition, but *the gland is unable to retain it*. This inability may be due to the suspension of what I have spoken of as the sphincteric power at the orifices of the milk ducts, whereby the milk is allowed to dribble almost constantly from the nipple. Or, again, but this is less common, there may be an excessive irritability of the nerves supplying the muscular tissue of the sinuses and larger ducts. When this exists, the slightest reflex disturbance, as that caused by applying the child to the opposite breast, or even an emotional disturbance, or some other equally trivial matter, is capable of causing an ejection of milk, and a loss, in consequence, of so much valuable food. These conditions, in part at least, resemble certain forms of vesical incontinence, and might be conveniently designated lacteal incontinence. They are usually characterized as forms of galactorrhea.

We should not treat galactorrhea by laxatives, iodide of potash, and restricted diet, which only tend to aggravate the evil, but by such tonic measures as the condition of the woman seems to demand. Our first efforts are addressed to improving the quality of the milk; for its quantity will diminish in inverse ratio.

If we fail to reduce the secretion to a desirable quantity, by good diet and the other means already spoken of, we resort to local mechanical measures. They are varied in detail, but have the common object in view of producing compression.

The simplest way of applying pressure to the breast is by strapping it with adhesive plaster. A more elegant means is to be found in compressed sponge. It is to be cut and pressed, to correspond with the shape of the breast, an opening being made for the nipple, so that the child may be put to the breast as usual. An abdominal binder passed around the thorax, and pinned tightly, holds the sponge in place. If we desire to exercise compression on one breast only, a sufficiently large hole should be cut in the binder, before its application, to allow the sound breast to protrude and remain free from pressure. After the binder is applied, we cut a second hole to allow the nipple of the compressed breast to become accessible and be relieved of pressure. After the sponge and binder are satisfactorily put on, we apply enough weak lead lotion to cause the sponge to expand to the desired extent. The fear entertained by some, that the tightly-applied binder would interfere with respiration, is groundless. I have never yet had a patient complain of the pressure upon the thorax, even when the binder was very tightly pinned. This sponge-dressing is to be changed twice daily, and is capable of accomplishing, in the neatest manner, all the good that can be done by pressure. It is certainly more cleanly, simple in its application, and uniform in its action, than strapping, bandaging, or slinging up the breast, and while it possesses the advantages of each, it is so easily put on that an educated nurse can be safely trusted with its application, under medical direction. The patient experiences great relief from the dressing, and by its proper use galactorrhea may often be perfectly controlled. It sometimes happens, that the means which have been described fail to control the excessive secretion; here it becomes necessary, and if the woman is being exhausted by loss of milk, imperative, to devise some means for diminishing, or even suppressing, the secretion. Before giving the measures for accomplishing this object, we will describe the following class of cases which require an identical treatment.

There are circumstances where the secretion is abundant, but owing to the child having ceased nursing, the milk, if left to itself, accumulates, and may lead to serious trouble with the breasts. Take as an example a breast which has been furnishing milk to a healthy infant for several weeks. The functional

activity of the gland we will suppose to be at its height. The mother's health is robust and her digestion active. Her child dies suddenly from some injury. The problem, therefore, presents itself of how we are to cause the cessation of lactation. We will suppose the expectant treatment to have been tried, and as a result the breasts are enlarged, firm, and painful. Attempts at rubbing, or pumping, out the milk prove of no avail. We are here threatened with a puerperal mastitis, unless some efficient means be used to control, or remove, the rapidly accumulating secretion. To the first of these we at once devote our attention. The breast being thoroughly dried and perfectly cleansed, we smear its surface with the officinal ointment of the iodide of lead, and then gently rub it in until a considerable quantity is absorbed. Soak a piece of sheet-lint, of a size sufficient to cover the breast, in the following solution: acetate of lead, from 3 ij. to 5 ss. to the pint, of a one-to-four solution of alcohol. If we desire a more elegant preparation, eau de cologne may be substituted. If there be much pain, it is often useful to apply an ice-bladder upon the sheet-lint covering the breast. The lint should be frequently dipped in the lead lotion. The following phenomena will present themselves: first a cessation of pain, fulness, and the uneasy feeling of distention, which is so annoying. It is common for the patient, who has been exhausted by pain, and consequent loss of sleep, to fall into a refreshing slumber soon after the application is made. In the course of three or four hours, the breasts may be completely emptied by an experienced hand. The ointment should be used as a lubricant during the manipulation. By applying the iodide of lead freely twice, or thrice daily, the secretion will be gone in less than one week, as a rule. The pivotal point in the treatment is the use of this ointment; the evaporating lotion, and cold, being only adjuncts. I have proved by repeated trials that, when applied alone, it is capable of exerting an absolute control over the secretion. I believe we here invoke a specific action from the lead iodide. A point of considerable moment is the partial anesthesia it is capable of inducing, which thus enables us to empty the gland, where before even slight pressure was badly borne. Its action without doubt extends to the epithelial cells and inhibits their secretory activity, as is seen in its action, in cases like the above,

in causing the drying up of the secretion. I was led to try this drug from the success I had met with in its topical employment in all varieties of adenitis. I used it at first for its anesthetic properties, as a lubricant for rubbing out a painful breast, and was considerably surprised at seeing the secretion rapidly diminish in breasts which had always been troublesome from hyperdistention. By investigating the relation between the amount used and the falling off of the milk, I concluded, that, by its judicious use, we can keep down the activity of a breast which has a tendency to become too full or is troublesome, owing to galactorrhea. I have given it an extended trial in both these conditions, and am fully convinced that it surely and specifically controls the mammary secretion. A substance possessing such power is manifestly a two-edged sword, and while it may be safely used, if used with caution, an excessive amount, or a want of due regard for the necessities of the case may cause the milk to be permanently suppressed. A word as to the use of belladonna. I must confess that I have met with poor success from its employment. My experience may have been exceptionally unfortunate, but reasoning from it alone, I could not recommend it as capable of accomplishing more than the expectant treatment.

An *obstruction to the removal of milk* is a fruitful source of trouble in dealing with the puerperal breast. This obstruction may arise from a variety of causes. It may result from the bending, or occlusion of the larger milk-ducts or sinuses, dependent upon a depressed nipple, or other cause. It more often is due to inspissation of milk, in the larger excretory ducts, or in the sinuses. It may arise from inflammation along the course of the excretory ducts; this form will be considered in detail when speaking of inflammation. Whatever be its cause, it is liable, if long neglected, to set up mammary inflammation. In other than inflammatory obstructions, or complete occlusion, somewhat powerful suction will often promptly relieve the trouble. To effect this, an older infant, with stronger powers, should be applied to the breast. If this fail or is not attainable, the mouth of an adult, as that of the nurse or woman's husband, may succeed. In many cases this condition tends to recur. When this happens, a pup, so scantily fed, as to be always greedy, will be found efficient and convenient for

emptying the breast. In general I would advise against the use of the breast-pump in cases of obstruction, for by reason of its greater power it is more liable to abuse than milder means. And, besides, the milder measures are sure to succeed, if the obstruction is of such a nature that it is safe to employ mechanical means to overcome it. The best way to artificially rid a breast of its contents, is by rubbing it out, as it is called, that is, by employing friction and pressure along the course of the milk ducts, the force being directed from the circumference to the centre of the breast. We here employ a *vis a tergo* which is not unlike the normal process of excretion. Unless a skilful hand be used to empty a breast, more harm than good frequently results. The following way of performing this manipulation I have found useful, and always instruct my nurses to employ it. Seat yourself beside the patient, so low that your left forearm rests lightly on, and is supported by, the woman's chest. Abduct the thumb of the right hand, and insert the crotch so formed well beneath the mammary gland. Now with the right palm sweep from the upper border of the breast downwards and inwards towards the nipple. By thus stroking the gland, and occasionally raising it from the chest-wall and rolling it between the palms, it may be softened down somewhat. It usually happens, that, at the end of ten or fifteen minutes of such manipulation, a drop or so of milk may be squeezed out, and the gland becomes softer and less nodular. When this state is developed, both hands are to be used as crotches, and while one lifts the breast from the chest-wall, the other is swept from the periphery toward the nipple. The hands are thus to be used alternately to support and rub out the breast. This determines the flow of milk towards the larger ducts and sinuses, and, after they are well distended, the nipple is to be milked, as one milks the udder of a cow. By following the above routine, I have often succeeded in throwing a stream of milk some feet from a breast, which fifteen minutes before would not yield a drop. And after the secretion is once started up, the breast may be emptied very rapidly. If the obstruction be slight, and the accumulation small, a few skilful strokes will start up the milk. I have tried many ways of manually evacuating a breast, and find the one here described the most efficient and least painful.

If there be an obstruction in a sinus, or in the duct leading from it, and the secretion of milk is going on in the corresponding lobe, the sinus may dilate, sometimes enormously. Inflammation usually results from such a condition, as already explained, but if the milk form slowly, and the tissues are relaxed, a galactocoele sometimes occurs.

It is around *inflammation of the mammary gland* that our interest especially centres in dealing with the puerperal breast. Few inflammatory conditions have the interest which it possesses, as few are, I believe, so preventable. The local results of an untreated mammary inflammation are exceptionally disastrous, and when the disease is left to pursue its course, it is not infrequent to find it protracted over a period of weeks or even months, during which the breast may be affected with a succession of abscesses, and riddled with sinuses. The disfigurement, which is so often left after a mammary abscess, is a great cross to most women; while the crippled or destroyed function of a breast discounts a mother's usefulness by that much. The sad effects on a woman's general health and the mental distress are often very great, and seemingly out of all proportion to the gravity of the local processes.

It should never be forgotten that no insignificant mortality has followed untreated, or unsuccessfully managed, abscess of the breast. I not long ago witnessed an autopsy on a woman, dead of septicemia, who had a small mammary abscess of one breast, which had been opened, but the main source from which she derived the septic poison was a large, although an unsuspected, subglandular abscess of the opposite breast. And this notwithstanding the fact that it had almost certainly existed for weeks, during which the patient was in very skilful hands and under careful observation, and had been seen by a number of competent medical men. I mention this case which, besides pointing to the danger to life which may threaten from an abscess of the breast, also shows how great care is sometimes needed to make a correct diagnosis.

Inflammation of the puerperal breast may be conveniently divided, according to that portion of the organ affected, into, (1) subcutaneous, (2) glandular, and (3) subglandular mastitis. The first and third forms are really extra-glandular and may be most conveniently considered by themselves; although their

close structural relationship with the gland should never be lost sight of, as it adds to their importance and often influences their course.

The *subcutaneous form* affects that portion of the connective tissue, which lies between and connects the skin covering the breast, with the fascia spread over the anterior portion of the gland, and extending to its margin. The connective tissue in this locality differs from that of the gland proper by its being less compact and containing in its areolæ nothing but fat, while it can be easily distinguished from the submammary connective tissue, with which it is continuous at the periphery of the gland, from the fact, that the latter is entirely devoid of fat and is much more areolar in structure. A subcutaneous mastitis may be located beneath the areola, under the skin, spread over the front of the breast, or at its periphery.

The causes of the form of inflammation we are considering are, in general, those constitutional and local conditions which result in the development of a phlegmon, in other localities. There are, besides, special local conditions, which render connective tissue in this locality particularly liable to inflammation. Among the more prominent of these are inflamed nipples, from which the inflammation may extend by continuity of tissue to that lying subcutaneously. Or septic absorption taking place through any of the numerous forms of solution of continuity, occurring on the surface of the nipple, is capable of lighting up inflammation. Subcutaneous inflammation occurs most often secondarily, and results from extension of a diseased process originally starting in the gland. If the inflammation be primary, and do not at any time involve the proper tissue of the gland, it has the importance, course, symptoms, termination, and treatment of an ordinary phlegmon. The absence of any special symptoms, and the slight constitutional disturbance, usually present, materially aid us in differentiating the subcutaneous variety of inflammation. Lactation usually causes but slight pain, and, as a rule, should be continued. The uselessness of trying to soften down an induration in the connective tissue, under the supposition that it is due to "caking," is obvious, while the direct harm, which may result from such a procedure, makes a correct diagnosis important. It is needful to keep the breast from becoming over-distended, and if lacta-

tion be impossible from pain of a sore nipple, or other cause, we may have to resort to gentle frequent frictions, by which means the milk will be made to flow easily, and the breast kept practically empty. This is quite different from those zealous attempts so often made to rid a breast of subcutaneous induration.

If a reliable preparation of the sulphide of calcium is obtainable, it will render good service, administered in one-eighth grain doses every hour. It is useful by preventing or limiting pus formation, while it diminishes the amount of induration and causes the abscess to heal rapidly. If suppuration be judged inevitable, a small poultice may be applied, although I prefer a pledget of cotton, soaked in hot laudanum, of a size sufficient to cover the indurated area, over which a bit of oil-silk is laid, and strapped on lightly by adhesive plaster. This is to be renewed four or five times daily, and besides its anodyne effect there is maintained a sufficient amount of heat and moisture to cause it to act as a foment. The surgery of subcutaneous mammary abscess has two objects in view. First to cause it to heal rapidly, with but little destruction of tissue; and second to prevent scarring. Both objects may usually be secured as follows. As soon as fluctuation is detected, open by the smallest possible prick of a slender sharp-pointed bistoury. Before incising, wash the skin over the abscess with a five-per-cent solution of carbolic acid. Express what pus can be made to flow easily by gentle continuous pressure. Before remitting the pressure, again wash the breast and incision by a two-per-cent douche of carbolic acid, and apply firmly a piece of carbolized or borated cotton over the incision. When the pressure of the fingers is withdrawn, the resiliency of the tissues causes the abscess cavity to dilate, but the air which enters is first filtered by being drawn through the cotton wool, and thus rendered aseptic. The dressing is to be held in place by a broad adhesive strap, with an ellipse cut in its middle, that the amount of soiling may be seen and the dressing changed when needed. The same precautions, to prevent the entrance of air into the abscess cavity, are to be observed in changing the dressings. Before removing the cotton, occlude the mouth of the abscess by compressing its sides and forcing out a drop of pus. The dressing seldom needs to be changed more than

twice. The results of this somewhat tedious procedure will amply repay for the labor expended. And your lady patients are seldom more grateful, than for your restoration of an inflamed breast to its former symmetry. When the inflammation affects the connective tissue lying beneath the areola, it often terminates in involvement and perforation of the sinuses or larger excretory ducts and may leave as a sequel a lactiferous sinus.

The *subglandular form of mastitis* is fortunately the least common of all. This is in great part due to its protected situation, the slight changes it undergoes during pregnancy, and the purely mechanical function it performs, viz., to support the gland. In fact, it admits of considerable doubt if it ever begins as a primary inflammation, for we can almost invariably trace its existence to a previous inflammation, existing either in the gland, or subcutaneous connective tissue at its periphery. Pus at times finds its way beneath the gland, and disseminating itself through the areolar tissue there, which is the least compact of any entering into the structure of the breast, it lights up an extensive phlegmonous inflammation, which usually terminates only with suppuration, and the formation of a subglandular abscess. The pus generally burrows beneath the gland, and appears at its margin. It may insinuate itself between the lobes of the breasts, however, and, commonly setting up inflammation along its track, point beneath the skin covering the convexity of the gland. I once saw a case in which the attending surgeon diagnosed a simple glandular inflammation, and made a superficial incision, but a more thorough examination surprised me by revealing a very extensive subglandular abscess, the supposed superficial abscess being a large sinus leading into the former. When this last course is taken by the pus, the true nature of the trouble is quite often overlooked, it being supposed, that the glandular, or subcutaneous was the primary inflammation. Occasionally the abscess points at some distance from the breast, as in the axillary or low in the left hypochondriac space. The pus, at times, causes one or more of the ribs to become diseased, and unless this be recognized and the appropriate treatment instituted, it will be impossible to heal the resulting sinus. The danger, both to the patient's health and life, is greater from the subglandular, than from either of

the other forms of inflammation. A correct diagnosis, and especially the detection of the presence of pus, is a matter of the prime importance and greatest difficulty.

We should always be on the watch for submammary trouble whenever there is a deep-seated glandular inflammation, for the pressure being least in the direction in which the subglandular areolar tissue lies, pus at times passes into it instead of discharging externally. When this happens, a rigor might lead us to suspect the true nature of the trouble, but it would be impossible to say with certainty that the inflammation was submammary until pus had formed in sufficient abundance to develop the classic gross appearances of a breast affected with a subglandular abscess. If the inflammation should start primarily in this location, it would be equally difficult to make an early diagnosis. After pus has formed, the picture is quite different, and the appearances are very characteristic of the seat and nature of the trouble. It has already been pointed out that usually the entire subglandular areolar tissue is diseased. When this happens, the appearances are typical. If a small portion only of the tissue be inflamed, the nature of the process must be surmised rather than diagnosed. An acute inflammation, then, affecting the greater part of the subglandular tissue, and terminating in a pretty abundant pus-formation, develops the following features.

The breast is enlarged, firm, and very protuberant; the skin is glossy, often edematous, and sometimes dark in color; more frequently it has a slight reddish blush, although it occasionally is of a pale, waxy hue, and traversed with prominent superficial veins. When the pus is present in large amount, the gland may seem to float, as it were, upon the imprisoned purulent pool. The finger-tips can, in certain cases, be carried well behind the margin of the gland, and marked fluctuation made out. In the less developed cases, it is difficult to determine fluctuation, excepting with the utmost care in examining. The pressure upon the gland usually diminishes the secretion, but it may persist without sensibly falling off.

If the *ensemble* of objective signs be more or less complete, the diagnosis is quite easy. In the less marked cases, it is often impossible to make more than a diagnosis of probability. The subjective symptoms throw but little light on the nature

of the pathological process taking place. There is a sense of fullness in the milder cases, a deep-seated pain in the more severe, which may be mild, or agonizing, according to the amount of distention, and the idiosyncrasy of the patient. There is one symptom which has often struck me forcibly, but which I have never seen mentioned, and that is an intense hyperesthesia, accompanied with tenderness, of the skin covering the breast, and for an area of several inches surrounding it. This is, I presume, due to the stretching of the skin; however this may be, I remember one case in which the hyperesthesia was so marked that acute suffering was caused by the weight of the bed-clothes, and the patient declared it to be the most distressing symptom of the many from which she suffered.

The constitutional disturbance is usually great, and is characterized by frequent and often severe rigors. These are at times due to septic absorption from the imprisoned pus.

The treatment is mainly preventive. If other forms be prevented, we need have but little to fear from submammary inflammation. If discovered early, pressure by strapping or compressed sponge is to be used. The breast should always be well slung up by means of a mammary suspensory, a silk handkerchief, or a breast binder; for the heavy breast drags directly upon the submammary connective tissue when left unsupported. Iced evaporating lead lotions diminish the congestion, and thus lessen the inflammation, and may be used to moisten the sponge, which acts both as a compress and support. Do not let the sponge get heated by its contact with the body, for it will then become a poultice and defeat your object. This may be prevented by laying an ice-cap upon the binder over the location of the sponge.

That you cannot often abort the inflammation will be easily appreciated when its causation is considered.

The surgery of submammary abscess is worthy of careful consideration. When pus is suspected, insert the needle of an aspirator deeply enough to reach it if it be present. Let it be thoroughly done, if done at all. More harm than good results from the half-hearted insertion of the hypodermic needle one so often sees in explorations for pus. I once found it impossible to convince a physician that there was pus lying under the mammary gland of one of his patients, and when I advised the use

of the aspirator to prove my statement, he declined using it, because he had shortly before inserted the hypodermic needle once, and obtained nothing. And this, notwithstanding that there were fully six ounces of pus beneath the gland, as subsequent events proved. The needle of the aspirator should be inserted deeply and often enough to exclude the possibility of an error. It is desirable to reach the abscess by the shortest route; if it be practicable, however, we should make our incision along the semilunar fold of skin at the lower border of the gland, as the scar left in this location will be well hid from view. It would be out of place to consider the general treatment of so essentially a simple surgical trouble. I will only add that I am convinced that, by securing very thorough drainage and employing rational antiseptic measures, the cases of long-continued suppuration will be but few; while the resulting loss of tissue and disfigurement may be reduced to a minimum. Aspiration of the pus and hyperdistention, with a weak antiseptic solution, would appear well adapted for the treatment of mammary abscesses; but I have not yet had a suitable case in which to test its efficacy. If death of a portion of exposed rib is the cause of prolonged suppuration, it needs to be dealt with on ordinary surgical principles.

Inflammation of the gland proper may be divided, according to the structures involved, into (1) parenchymatous, and (2) interstitial mastitis. Inflammation of the parenchyma will be considered somewhat in detail, for experience has convinced me that it is the key to the pathological situation, and I am persuaded that we have here to consider the causative factor in the vast majority of cases of sore breast.

We would naturally expect the parenchyma to be the starting-point for the pathological changes occurring in this organ, for it is the secretory tissue which has been rapidly projected from a state of comparative quiescence into one of the highest activity; while, on the other hand, the connective tissue has suffered a simple mathematical increase, rather than a physiological differentiation.

The *parenchymatous variety of inflammation* may be subdivided into that (*a*) of the ducts and sinuses; (*b*) of the lobules or secretory tissue proper of the gland. The ducts became the seat of a catarrhal inflammation, and the causes are such as

would set up a catarrhal inflammation in any tubular structure lined with epithelium; as, for instance, it may result from exposure to cold, as would a bronchitis, or from the reception of an injury, as does an epididymitis. There is besides one special cause not seen in other glands, and that is inflammation due to the prolongation of the normal functional activity of the gland. For it is well established that the comparative frequency of mammary inflammation during the latter months of suckling is due to prolonged lactation.

An inflammation starting in a sore nipple may travel down the ducts and cause them and the sinuses to become affected. This is a much less common occurrence than is generally supposed.

However it be set up, it is not unusual for the inflammation to pass away of itself after having caused some obstruction, given rise to quite considerable constitutional disturbance, and excited the anxiety of the patient. If a considerable atresia of the duct exist sufficiently long, and the secretion of the lobules from which this tube leads be active, we sooner or later have a distention of a portion of a lobe, or if the obstruction be situated in a sinus or in one of the larger ducts, the entire lobe is distended. Besides obstruction caused by inflammatory swelling of the epithelium of the ducts, it may be due to mechanical impediments, as has been shown when speaking of obstruction to the removal of the secretion. The importance of this matter is my excuse for speaking of it again somewhat in detail. We have a patient, for example, with a sensitive or deformed nipple, and because of the pain caused by suckling, or the structural impossibility of performing that act, the breast is habitually imperfectly, if at all, emptied of an accumulating secretion. The milk remaining stagnated so long in the ducts or sinuses, becomes partially desiccated, owing to the active lymphatic absorption, and a plug of thickened milk is formed, beyond which the secretion accumulates, distends the ducts and acini, and causes them to inflame. The sinuses especially act as efficient barriers to prevent the discharge of milk. By their shape and the extent of surface exposed, the secretion, if it remain long in them, rapidly thickens from the removal of its watery constituents. When the sinuses become hyperdistended from an accumulated secretion, the muscular tissue in their

walls loses its power to contract and force out the contained milk; as the subareolar tissue is much more lax here than the interstitial tissue in the gland, the sinuses are the first to distend and dilate more largely than any of the smaller milk ducts. When thus distended, they are liable to inflame, and the process extending to the adjacent parts causes an abscess in the connective tissue beneath the areola. Or an inflammation starting here may extend down the ducts until it reaches the acini and causes them to inflame. The way it usually sets up a parenchymatous inflammation, however, is by offering an intractable obstruction. Lastly, obstruction may follow from bending of a duct, or its complete closure due to previous inflammation in or around it.

The causes of obstruction to the exit of milk then are: (1) atresia of a milk duct from inflammatory swelling, (2) occlusion of the calibre of the tube by a plug of inspissated milk, (3) structural alterations resulting in the obliteration of the lumen of the tube. Whatever be the cause of the obstruction, if the gland is actively secreting, the milk rapidly forms behind it, and, being thus dammed back, distends the ducts and acini.

The imprisoned milk soon undergoes chemical changes. It can be easily demonstrated that the milk which first flows from a breast that has been overdistended for some time possesses a decidedly acid reaction. If it be altered no further than this even, the epithelium which it bathes quickly resists its presence, and inflammation is set up. Or it may happen that commencing septic changes have followed the stagnation of the milk, and here we have a powerful agent for initiating an active inflammation. These are in brief, then, the usual causes of parenchymatous inflammation of the breast:

(1) A hyperdistention of one or more lobules and ducts of the gland from an imprisoned secretion which causes them to inflame. (2) Alterations in the retained milk, resulting in the formation of lactic acid or in the development of septic changes. Besides those already mentioned, the secretory tissue may become inflamed from traumatism, constitutional exhaustion dependent upon lactation, unfavorable puerperal convalescence, and from diverse other causes. The epidemic appearance of cases of mammitis, sometimes occurring in

hospitals, is easily explained, if we recollect how the bad hygiene so often seen in them predisposes to catarrhal inflammations. And it will be found that a like catarrhal process is lighted up in the mammary gland, which either affects the acini directly or terminates in their inflammation, by first causing an obstruction to the removal of the milk.

We will consider next the *interstitial form of mastitis*. I have already expressed the belief that the interstitial variety is nearly always secondary to a previously existing parenchymatous inflammation. Let us see how this inflammation, starting in the gland, comes to affect the connective tissue which environs it. The milk accumulating in a lobe causes it to expand, and puts the pouch of connective tissue, in which it lies, upon the stretch. The comparatively dense tissue found surrounding the lobe resists this injury and inflames. Besides the accompanying active inflammatory congestion, there occurs a passive hyperemia which is brought about as follows. The blood-vessels, which are very abundant throughout the gland, are compressed by the lobules already swollen from the imprisoned milk, as well as by the inflammatory effusion of liquor sanguinis. The arterial pressure being greater than the venous, more blood is pumped in than can be removed, and the gland becomes engorged, and a passive is added to the already existing active congestion. The increased amount of blood present in the gland augments the secretion of milk, which, by distending the lobules still more, makes the pressure greater upon the vessels. This serves to explain why a breast so rapidly distends, becomes hard and painful, and so quickly falls into inflammation. It also enables us to understand one way in which parenchymatous causes interstitial inflammation. The connective tissue between the lobules and ducts may inflame from extension of an inflammation located in the parenchyma, in the nipple, or in the subcutaneous or subglandular connective tissue. In a small number of cases, the trouble may be traced to the lymphatics. From nipple inflammation or septic absorption, through some breach of tissue, there may be formed one or more sympathetic buboes in the lymphatic chains situated in the gland or beneath the skin, which often lead to inflammation in the surrounding tissue. It should be remembered that an abscess

can only form when the connective tissue has become inflamed, and that, therefore, a parenchymatous must set up an interstitial inflammation before an abscess or other serious trouble can result to the gland.

It may seem needless to describe the too familiar picture of a *threatened mastitis*. Inflammation of the puerperal breast most frequently occurs during the third or fourth week after delivery. The attending physician has become an infrequent visitor, or has discontinued his services. When he last saw his patient, both she and her child were enjoying the pleasure of active, healthy breasts. He is summoned now to find all this much changed. The mother has a large, firm breast, which is hourly becoming more heavy and painful. The child is crying lustily, and distress reigns where peace had its abode. The mother says she was suddenly chilled by a draught of cold air; her nipples had become so sensitive that the usual period for suckling was passed; her bowels were neglected, a too rich dinner was indulged in, or some other disturbing cause was present. The breast became somewhat enlarged and quite sensitive; owing to the pain caused by suckling, the child is allowed to empty the breast but imperfectly. The pain meanwhile steadily increases, and the child is able to do but little in removing the accumulating secretion. Later it is put to the breast frequently in the mother's anxiety to start up the imprisoned milk. Lactation becomes progressively more painful, while the child with cruel greed and merciless power tugs away with the persistence of a veritable Tantalus, for the much coveted nourishment which is so near, yet so impossible to obtain.

The constitutional symptoms are as well marked as with any of the severer forms of catarrhal inflammation. There is the usual chill followed by pyrexial symptoms. If it be not catarrhal, the constitutional symptoms are not more severe than those accompanying most superficial inflammations. The local signs differ in the different forms of inflammation, and vary also according to the nature of the obstruction. And first, as to the parenchymatous varieties, if there be an inflammatory obstruction in one of the large ducts, or in a sinus, and we examine the case early, we find a well-defined hard lump situated in the substance of the gland. It is wedge-shaped, has a knotted feel, and is painful upon manipulation. The rest of the gland may

be relaxed and flabby. The constitutional disturbance is well marked. On the other hand, the local appearances of lacteal engorgement, either accompanied or followed by plugging and retention of milk, not being at first attended with inflammation, are essentially different, and this enables us to make a diagnosis. The swelling of the gland, where there is lacteal engorgement, is more uniform than when inflammatory obstruction exists, and the whole comes to feel like a mass of knotted firm cords under the finger. The swelling may be great, but the local and general signs of inflammation are not present for a considerable time, and are gradual in their onset, while they are much less severe than in the other forms. The behavior of the milk is quite useful in determining the character of the process. For, while in the former you usually have no mechanical difficulty in expressing milk, as only a part of the gland is affected, in the latter it may be impossible to squeeze out even a single drop.

After inflammation is well established, and the ducts and lobules go on to excessive distention from the incarcerated milk, it becomes impossible to determine the exact local condition present.

If, following the parenchymatous, an interstitial inflammation be set up, the general symptoms become more severe, while such local signs of inflammation as pain, redness, heat, and swelling increase. The character of the swelling soon changes, and from having been circumscribed becomes diffuse, and the induration evidently more subcutaneous and boggy, while the skin covering the breast may get livid and edematous. The sense of weight, distention, and pain become well-nigh intolerable. The symptoms get worse while pus is forming, and continue severe until it finds its way externally.

If the inflammation be severe, a portion of the gland may slough, and be discharged through one or more sinuses. A succession of abscesses is unfortunately too common, as may be easily understood if the causes of mammary abscess already pointed out are appreciated. Sinuses may remain for a long time, discharging abundantly, and weakening the patient, so that many of them come to look as if suffering from phthisis instead of from slight suppuration.

The proper treatment for abscess affecting the mammary gland is preventive.

I believe that if breast troubles be taken sufficiently early, abscess of the parenchyma or interstitial tissue may be speedily and easily relieved, and suppuration prevented. The only exceptions to this rule are, first, extensions of inflammation from the subcutaneous tissue, and they occur so rarely as practically to be left out of account, and second, organic stricture somewhere along the course of the milk channels.

If the pathological views which I have advanced and, of necessity, hurriedly described have carried any degree of conviction, the importance of preventing inflammation of the parenchyma will be appreciated. I believe that we can arrest parenchymatous inflammation if we see it when first starting, and by preventing this, we render the danger of interstitial inflammation almost nil.

The means for arresting inflammation of the tubes, sinuses, and lobules is to keep them emptied of the milk. This may usually be done by gentle frictions, as already described.

But we not infrequently meet with a breast from which the greatest manual dexterity or any mechanical means fail to remove even a drop of milk. If the secretion be allowed to go on forming, we may count on inflammation being set up, with considerable probability. Our only hope of averting this catastrophe lies in our power to arrest the formation of milk. The anesthetic properties of the ointment of the iodide of lead have been pointed out, and my belief in its power to specifically arrest the secretion of milk affirmed. Viewed from the pathological stand-point we have considered, let us see how it presumably acts in aborting mammary inflammation.

We will assume—and a trial will convince the most skeptical of its power—that the ointment has arrested the secretion. The lobules, which had been rapidly distending from an accumulating secretion, get accustomed to a constant, or, it may be, a diminishing pressure, and become less sensitive. The sensibility is considerably blunted also by the influence of the ointment. Called upon, however, to choose between a considerable danger of inflammation and a possible future lessening of the milk supply, I do not think many will hesitate long in determining to risk the latter. Besides, it is not often necessary to carry the physiological effects of the lead iodide beyond the point of causing a temporary suspension of the activity of the

gland. For it will usually be found that in the course of two or three hours, the secretion may be worked out by gently rubbing the breast, and its reaccumulation prevented by the same manipulation, or, by applying the child, if suckling do not cause too great pain.

If we see the case so late that suppuration seems inevitable, the connective tissue between the lobes having become affected, we are to apply the iodide of lead ointment freely every fifteen minutes, as already recommended; and if the pain be very severe, the lead evaporating lotion and ice-cap are also to be used, as previously described. Refrigeration and the saturnine lotion, by lessening the amount of blood in the gland, materially aid us in holding in abeyance the inflammatory process; and the time gained is valuable, by allowing the specific action of the lead iodide to declare itself, while their application gives much comfort and relief from pain. When used alone, they are incapable of aborting inflammation unless employed early. Their proper sphere is to aid the action of the iodide of lead, but never to supplant that ointment. If frequently recurring cakings of the breast take place, it may be needed to stop the secretion of milk permanently, and this we can invariably do by using frequent inunctions of the lead iodide ointment.

As to the employment of poultices, on which so many rely, and employ fomentations to abort inflammation, aid suppuration, or open and evacuate the resulting abscess. In the first place, I believe that poultices should never be used in parenchymatous mastitis. They lead at first to a sense of comfort, but the relaxation of tissue caused by the fomentation tends to increase the secretion and add to the already existing pressure. If the inflammation start in the interstitial connective tissue, which but rarely happens, poultices may aid to abort it; but even here the resulting good is problematical.

The abuse of the poultice in mammary inflammation is as inexcusable as it is general. It is my opinion that they do more harm than good, as, indeed, all routine treatment does. It would often seem that the breast had as much to fear from injudicious poulticing as from inflammation. As the result of prolonged poulticing, how often one sees a breast with numerous sinuses, separated by water-logged, congested tissue, apparently incapable of setting on foot a healthy reparative process.

What needless inroads on the woman's strength are caused by the prolonged pus formation, and how sad the disfigurement of the once shapely breast!

It is not possible to more than point out our therapeutical armament here, and the special warfare in which it is to be used. The details of the battle must be left to the wit of the physician at the bed-side.

We may be called so late that pus has already formed, and the question of getting rid of this and healing the abscess needs to be considered.

The early detection of pus conserves to the preservation of the gland tissue, and is of prime importance. The following is a very convenient way for detecting, and at the same time opening, an abscess of the breast, if pus be found. Plunge into the most dependent point of the suspected abscess a specially constructed aspirating needle, which has a deep groove, like that of a director, along its upper edge. If pus is obtained on aspiration, pass a straight bistoury along the groove, and withdraw it, at the same time cutting in the direction of the tubes; that is, radiating from the nipple. By gentle continuous pressure, express the pus, and apply the dressing in the manner already described when speaking of the surgery of subcutaneous abscesses. Support the breast and dressings by an abdominal binder, pinned tightly around the thorax. Examine the dressings at the end of twenty-four hours, and if there be no constitutional symptoms, indicating the involvement of new areas of tissue, do not disturb the dressing unless much soiled. At the end of another twenty-four hours, change the dressings, using the precautions to prevent the entrance of air, spoken of when dealing with subcutaneous abscess. At the end of one week, the abscess will almost invariably be found healed. Keep the secretion of milk at the lowest ebb by the iodide of lead ointment, and the gland emptied by gentle friction, employed when changing the dressings, or more often, if need be.

I give sulphide of calcium in mammary inflammation and suppuration with the best satisfaction.

Mammalgia, or neuralgia of the breast, is of somewhat frequent occurrence during lactation. It is often supposed to be simply pain accompanying a threatened inflammation of the gland, and is treated accordingly. It is unaccompanied by any constitutional reaction, as a rule, but the pain and tenderness

may be very severe. The pain is easily subdued, and quickly subsides under the application of the iodide of lead ointment, which acts as a local anesthetic.

It would be taking us far beyond the bounds of our present discussion to consider in detail the pathology of sore nipples. Suffice it to say, that the treatment of all affections of the nipple, other than hyperesthesia, is the treatment of a simple inflammation. Nowhere do we have an opportunity to obtain such satisfaction from prophylaxis as in the prevention of sore nipples. Massage has been spoken of sufficiently. There should be used in conjunction with this, for one month before confinement, the following, which is to be applied on a bit of soft muslin, and worn continuously.

R	Acidi tannici.....	iv.
	Glycerinæ.....	i.
	Aquæ.....	ad 3 ij.

M. et Sig. Rub up thoroughly, and apply.

This strong solution of tannin, applied constantly, acts on an entirely different principle from a similar weaker combination of tannin and glycerin, or from the many substances recommended for hardening the nipples. By its application, we actually tan the nipple, so that it becomes darker in color, and nearly as tough, resilient, and incapable of inflammation, as would be so much leather. If the nipple has not received preparatory treatment, by keeping the surface clean and dry, we may often prevent trouble. If trouble exist in one nipple only, enforce absolute rest of that breast, and keep it emptied by massage. The worst cases of simple inflammation of the nipple will heal in two or three days, if thus given an opportunity. It is where both nipples are affected that we need to exercise our ingenuity. I am opposed to allowing suckling through a sore nipple, and whenever the patient is sufficiently intelligent have her or her nurse, if she have one, work out the milk, and feed the child with this during the day or two required for healing them. I find nothing better as a local application than the strong tannin solution already given, rubbed up with enough simple cerate to make a convenient ointment. Build a diminutive mound around and upon the nipple with this ointment, and apply constantly until healed. By thus excluding the air, and by the astringent action of the ointment, we can heal even deep ulcers of the nipple with astonishing rapidity.

PRACTICAL REMARKS ON THE MANAGEMENT OF THE
SECOND STAGE OF LABOR.

BY
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My experience in the lying-in wards of Charity Hospital, Blackwell's Island, includes about one hundred births. During that service it was my study to ascertain that method of delivery by which the parts of the mother would suffer the least damage, and the patient endure the minimum amount of pain. I have made use of the different methods of supporting the perineum spoken of in the books; have employed lubricants and emollients, and, although I have succeeded in keeping the shortest diameter of the child's head in the longest one of the pelvis, yet I am convinced that, in the practice of the young obstetrician at least, many perineal lacerations are caused, and various puerperal diseases brought about, which might be prevented by following the mode of procedure to be cited. This method, I think, may be adopted with success, as a routine practice in the case of primiparæ, unless there are positive contra-indications, and oftentimes followed, too, when the patient is the mother of several children. Under the most favorable circumstances, the accoucheur is frequently disappointed with the termination of the second stage of labor. The head has reached the inferior strait and just when he supposes that he can control the force of the uterine contractions and the advancement of the fetus, the nervous and excited patient suddenly forces the child's head through the perineum, tearing it to the sphincter ani, or possibly rupturing that muscle. If he anticipates such a result, he may in his endeavor to keep the head flexed upon the breast, and to retard its progress as much as possible, exert so much pressure upon the occiput and force the chin upon the perineum so firmly, that damage is done where non-interference would have served a better purpose.

A physician in the first years of his obstetrical practice has, in almost every labor, a definite plan of delivery, modified in

each particular case by the size and shape of the fetal head and the pelvis of the mother. But rarely is he able to carry out his intentions to the letter. In one instance he maintains the flexion of the head as he wishes, and even succeeds in getting the sub-occipito-bregmatic diameter out of the pelvis; but the movements of the mother prevent his keeping the chin away from the perineum, and the favorable result is compromised by some degree of laceration. In another, the patient is of so low an order of intellect that, when suffering the intense pains of child-birth, the obstetrician has practically no control over her, and the child comes into the world with a rush, which is only complimentary to the muscular power of the uterus. Every young physician has experienced troubles of this nature. In regard to the administration of chloroform in parturition, various opinions have been expressed by writers on this subject—some prohibiting its use entirely; others advocating it in all the stages of labor; and it has been recommended, too, in all the degrees of anesthesia. However, it is not generally thought by the profession to be indicated except in the latter part the second stage, and then only in sufficient quantity to partially control the pains and to alleviate the sufferings of the mother; since, if too freely given, it delays the labor, retards uterine contractions after the birth of the child, and thereby is often a cause of post-partum hemorrhage. In a hospital service we may find it necessary to administer chloroform only in exceptional cases; but in private practice, where a physician's success depends so much upon his ability to lessen the sufferings of his patient, an anesthetic is indispensable and must be employed at the right time and in proper quantity. In the first stage of labor the obstetrician is called upon to do very little, while his duties in the second, being of much greater importance, should be studied with corresponding interest. My opinion as to its management, and my reasons for believing that the following mode of delivery may be adopted with advantage by those in the first years of their obstetrical practice, can be stated in a few words. Let us suppose that our patient is a primipara, somewhat advanced in years, of a nervous and excitable temperament, and having a thick and non-elastic perineum. Patients of this description are not rare. I have a number in mind. She has become somewhat restless and

uneasy with the teasing pains of the first stage, and anxious about the termination of her illness. Now that the os uteri is fully dilated, and has allowed the head of the fetus to pass through, she is for the first time stimulated to exert all her muscular power to expel the contents of the uterus. She is at first courageous and hopeful; but when she realizes that she is making but little progress, and that perhaps all her suffering is accomplishing nothing, she is again excited, perhaps delirious, and oftentimes it is with the strength of despair that she forces the head of the child through the pelvis into the world. When shall we interfere?

We will permit the fetal head to become moulded to the shape and size of the pelvis; we will allow it to come down upon the perineum, and to put the soft parts on the stretch by its alternate advancement and recession. We will maintain the flexion of the head upon the sternum by upward pressure upon the forehead. All of this time we are regulating the efforts of the mother, guided by the rapidity with which the child is advancing. At last the critical moment arrives: a portion of the occiput protrudes from the vulva, the perineum is stretched until it is shining in appearance, resembling distended parchment, and is hardly thicker than paper; the engorged veins stand out prominently, and appear to be at the point of rupturing. It would seem now that the slightest advancement of the child, or the least increase of pressure from behind would be sufficient to overcome what little tenacity remains in the soft structures, and that the head would be born at the expense of everything between vagina and rectum.

The time has come when we may, by our efforts, mitigate the agony of the mother, and, as a rule, preserve the perineum intact. The instant that the physician can reach the chin of the child, by carrying the index finger into the rectum of the patient, he is master of the situation. He can control and deliver the head, and he requires no more aid from the mother. Now he may direct his assistant or the nurse to administer chloroform for a few seconds. He, in the mean time, with finger in the rectum, holds the chin immovable. If he is unfortunate enough to allow the head to recede (which mishap may easily be avoided), the patient must be permitted to return to consciousness, and urged to bring the chin again within

reach. A few inhalations of chloroform are sufficient to completely quiet the patient, to arrest all her endeavors to expel child, and to allow its passage without pain. The accoucheur has before him now simply a mechanical task, viz., to extract a body from an aperture, as he would remove a ball from a tight pocket. To be sure, the confined body is grasped firmly on all sides by the margins of the cavity. But while the lower side of the opening is dilated to its utmost capacity, the parts at the sides and above will permit still further distention, so that room may be gained by greater enlargement in these directions. In addition, the body to be removed is not spherical, and the physician may economize space by delivering the shortest diameter first. The tissues with which he has to do are now to all intents and purposes inert, and his manipulations are not impeded by any movement on their part. There is no necessity for haste. Little by little he can evert the edges over the advancing globe, keeping it well pressed upwards, always remembering that the inferior surface of the opening is bearing the most weight, and is in the greatest danger of laceration. Gradually the longest diameter of the body reaches the external world, and the remaining part readily follows. This, I think, is a true representation of the mode by which the physician may deliver the fetal head, and the attending difficulties are not underrated. The inclosed ball has its exact analogue in the fetal head and maternal pelvis. When the patient has been anesthetized, and the obstetrician can pass his finger back of the chin of the child, he is working under almost the same conditions as the mechanical operator.

To recur to the case before us: We have reached that part of the second stage at which a portion of the vertex protruded from the vulva, and the accoucheur could lay hold of the chin. Now he can gradually extend the head, which up to this time has been strongly flexed, keeping it away from the perineum by pressing it firmly upon the pubes, and equalizing the pressure on all parts of the vagina as much as possible. Gradually different portions of the vulva can be pushed backward and slipped over the head. He, in the mean time, is watching the perineum carefully, and slowly causes the chin to advance. If he thinks the tissue will not bear any increase in the diameter of the head, he can still maintain the short mea-

surement by ceasing to extend for a time, and bringing the occiput still further forward, or pushing the soft parts back on the sides of the head until he finds the chin is not so firmly imbedded in the perineum and can again advance without danger. So at length it glides out of the vagina. Now, if he has administered the chloroform sparingly, the patient has so far recovered self-control that she can be induced to exert sufficient muscular force to rotate the shoulders into the antero-posterior diameter of the pelvis. Another whiff of the anesthetic, and he delivers first the lower, then the upper shoulder. The body of the child comes into the world without difficulty.

There is no claim to originality in this article. It is true that all of the foregoing main points of procedure—the mechanism of labor, use of chloroform, supporting the perineum, etc.—are explained in all obstetrical books; yet the detailed routine practice to be adopted in the simplest cases of parturition—vertex presentation—occurring as they do about ninety times out of a hundred, is not described in a style easily understood by the inexperienced physician. At the expense of much time and labor, the management of complicated midwifery has been made plain to the profession, while the care of the so-called “normal labors” is left, to a great extent, to the judgment of a person who perhaps has never witnessed the birth of a child.

FIBROMATA AND CYSTO-FIBROMATA OF THE OVARY.

BY

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(With four woodcuts.)

(Concluded from July Number.)

TURNING now to the "geodes" or, as we prefer to term them, "commencing cysts,"¹ we find them to be rather peculiar, in fact not as typical, or as valuable for purposes of study, as many which we shall find in other fibrous tumors. Sections through several of these little bodies showed, beside the ordinary fibrin network in their interior, an absence of a clearly-defined limit.

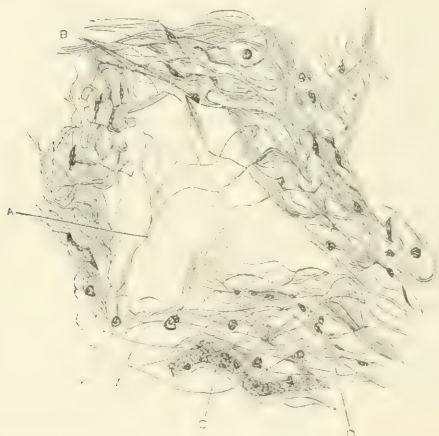


FIG. 1.—Showing initial stage of geode-formation. A, Geode crossed by fine fibrillæ of connective tissue. B, Loose fibrous tissue surrounding cavity. C, Blood-vessel. D, Small lymphatic (?), apparently connecting with the cavity (1/5 obj.).

ing tissue. Spindle cells were few in number around these spots; along their edges there were none at all. The fibres did

¹ An acknowledged inconsistency, since it assumes a fact, before it has been proved.

The writer has never been able to appreciate the exact fitness of Cruveilhier's term, though, for want of a better, it has been constantly employed ever since its origin. As regards its origin, the expression, "spot of softening," "edematous patch" means quite as much. But as long as we regard these spots not as chance occurrences, but as the first beginnings of cysts, why not designate them by some name more definite than the term borrowed from mineralogy?

not always show the usual tendency to parallelism. Most remarkable were the dilated vessels and hemorrhages at the border of one of the spaces, the blood-cells escaping directly into the interior, or only separated from it by a narrow partition of fibrous tissue. In connection with the vascular changes around the large cyst and throughout the solid mass of the tumor generally, the above facts are significant, and will be again referred to in connection with the question of etiology. Such is a review of the main facts gained by inspection of the present specimen. Any that have been omitted will be alluded to in the course of the next study, which will be to follow step by step the changes through which an edematous patch of microscopic size passes to reach the dimensions of an immense cyst.

The most instructive specimen obtained was a large fibrocystic tumor of the kidney,¹ which, on gross inspection, could not be distinguished from similar growths arising from the uterus. The solid portion of the tumor was soft and edematous-looking, and many "mucoid"² patches could be seen with the naked eye. Microscopically the same fibrous stroma was apparent as in previous cases, yet everywhere loose and wanting in density. The softened spots certainly seemed to be composed of a "myxomatous" tissue, and this probably induced Dr. Garrigues, in giving his report of the specimen, to characterize it as a "fibro-myxoma"—an ill-defined, but convenient, term. The "geodes" were mainly studied by the writer; they were different in structure from others subsequently observed, since, instead of being surrounded by firm fibrous tissue, the vicinity of the patches presented a loose, trabeculated structure. As seen with a low power, the branched and spindle-cells scattered throughout this network served to strengthen the illusion that this was true myxomatous tissue. The smaller "geodes" were not cavities at all, but apparently only rarefactions in the midst of the dense stroma; in the larger ones there was a central clear

¹ Removed by Dr. Thomas at Woman's Hosp., Oct. 15th, 1881. Reported in *Med. News*, Jan. 7th, 1882. Also by Dr. H. J. Garrigues (*Med. Record*, March 18th, 1882, and also in previous number). The writer was able to examine the larger portion of the fresh specimen, but will be obliged to refer to Dr. Garrigues for a description of the cyst-contents, which that gentleman examined.

² A comparison suggested by Dr. Welch. Reference to Péan ("*Hystérotomie*," chap. iii., p. 82) furnishes the expression "mucous transformation," used in this connection.

space, more or less encroached upon by fine tendril-like fibrillæ interlacing in every conceivable manner. In the large cavity figured (which to the naked eye recalled a cut section of the umbilical cord) there was nothing like a limiting wall, no trace of beginning condensation of the tissue, as at the edge of a true cyst. Looking at the whole field, the impression was that the cavity had been left by the forcible separation of the fibrillæ, the ends of which seemed to stretch out to meet each other across

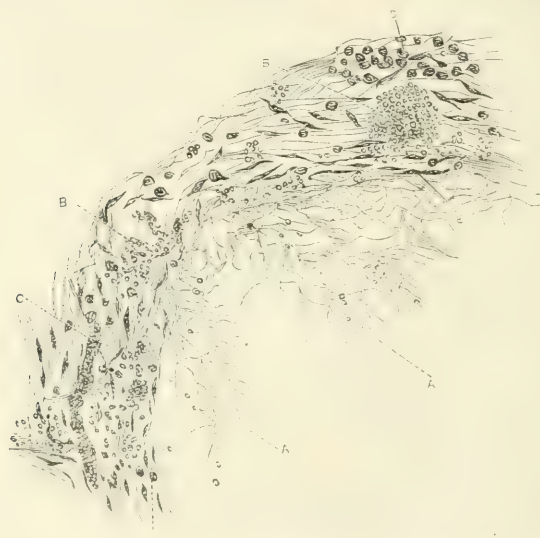


FIG. 2.—Geode in more advanced stage, surrounded by evidences of vascular changes. A, Fine network of fibrin adhering to wall of commencing cyst. B, Interstitial hemorrhages. C, Blood-vessel. D, Connective-tissue cells. E, Spindle-cells, arranged in parallel order along edge of cavity (1/5 obj.).

the intervening space. The loose mesh-work around the space spoke of a like tendency to separation, and the force, whatever it was, must have been *eccentric*. Such appearances as the above are to be carefully distinguished from the artificial spaces formed in dense fibromata by forcible tearing apart of adjacent fibres. This is an accident in the preparation, and the network is much coarser, while the torn ends of the large fibrous bundles can easily be recognized.

Now, though the surrounding tissue in this case was so loose, it was less so than in the vicinity of smaller "geodes." Evidently there was an approach towards a cavity with a more regular outline, even at this early stage. With a higher power,

the writer's views were materially modified. There was a disposition towards parallelism in the arrangement of the spindle-cells, though only over a limited area, as in the former specimen. These, together with branched cells, were numerous. The fibres themselves were seldom parallel, generally interlaced. The vascular supply was free.¹ To the writer's mind, the resemblance of this section to that made through the edge of the cyst previously studied seemed not so remote but what a possible sequence might be inferred. In the fresh specimen, the "geodes"

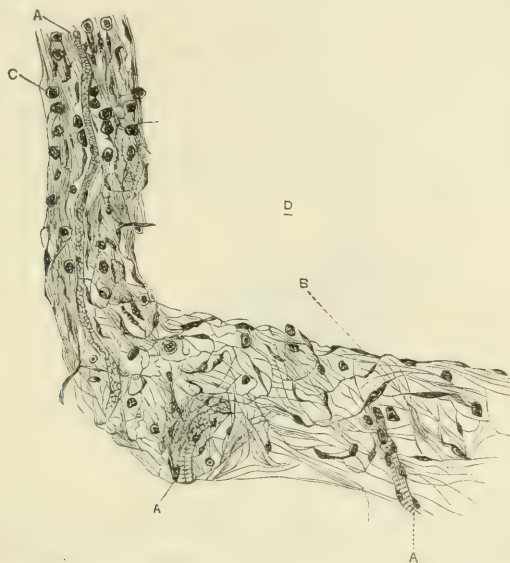


FIG. 3.—Section through a small cyst. A, A, Blood-vessels. B, Spindle-cells placed end-for-end at edge of cyst. The cells are somewhat swollen. C, Collection of connective-tissue cells. D, Is placed in the interior of the cyst (1/5 obj.).

were not empty, but each one contained a mass of semi-transparent, gelatinous matter, proved to be made up largely of coagulated fibrin, including lymphoid cells in its meshes. Naturally, in the process of hardening, this delicate structure was destroyed. In the sections made by the writer, but few leucocytes were found. Dr. Welch,² however, states that the "gelatinous patches" contained "serum and numerous leucocytes."

Enough has been said to render it evident that we have

¹ But there was no marked evidence of interference with the capillary circulation.

² In his official report (vide Med. News, Jan. 7th, 1882).

here no ordinary "mucoid metamorphosis," neither a "myxomatous degeneration," any explanation of which changes, or reason why they should be of such limited extent and infrequent occurrence, is purely hypothetical. Even if one were content with the gross examination of the specimen, the doubt would immediately suggest itself, if this tumor be the seat of degenerative processes, why are they so widely isolated, so circumscribed, and yet so identical, no large softened spot being farther advanced than its neighbor of microscopic size?

And then, referring to a cavity of the size figured, how account for this by a simple mucoid change? The writer confesses his inability to accept this theory, and yet his experience with the microscope has been too limited to justify him in any dogmatic assertion. Long and careful study of normal connective tissue is necessary before one should be willing to assert positively that such a transformation may not occur.

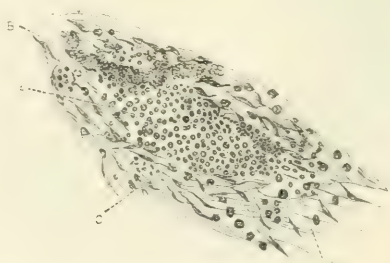


FIG. 4.—Showing lymphatic obstruction. A, Dilated lymph-space, packed with small round cells. B, Blood-vessel more deeply placed. C, Leucocytes, lying between the spindle-cells. D, Smooth muscle-fibres inclosing lymph-space (1/5 obj.).

Numerous other "commencing cysts" were examined from tumors of the uterus. All bore a general resemblance to those described, yet sets of sections from one tumor possessed personal peculiarities, which slightly distinguished them from a series taken from another specimen. The stroma surrounding some was looser than that around others, containing a less number of spindle cells and few parallel bundles of fibres. Some possessed more vascular neighborhoods, many no trace of vessels. In a few, the exquisite network of coagulated fibrin was preserved, clinging to the edge of the cavity, and inclosing blood-, lymph-, spindle-, or branched-cells. In other cases, the fibrillated connective tissue and fibrin were intimately blended, so that it was hard to say where the line of demarca-

tion was. Yet the same type was preserved throughout; everywhere a tendency to circumscribed separation of adjacent fibres, from the first suspicion of rarefaction, up to the formation of spaces larger than a pea, a process in each case *beginning at a centre and radiating outwards*. If asked whether he had ever observed the formation of geodes in any other way than that above described, the writer would reply in the negative. This possibility has not been lost sight of, yet in no case has the element of hemorrhage, hyaline, fatty, fibrous, or any other sort of degeneration, appeared to be the *primary* cause of these peculiar patches. As far as he has a right to generalize from such incomplete observations, he believes that this process, whatever it may be, is originally *not a degenerative one*.¹

The writer committed himself, to a certain extent, when he spoke of these gelatinous masses in the beginning as "commencing cysts." Such he believes them to be, though he has never found a "geode" of sufficient size, or a true cyst small enough, to serve as a missing link between the two. We have only infancy and age before us to infer what the transition period must have been; yet the data are not uncertain, in spite of numerous lacunæ. The etiology of the initial softened spots explains their subsequent development. To this let us now turn, and before seeking light from the bibliography, try to find the clew for ourselves.

Of the two cysto-fibromata which the writer has been able to examine fresh, both showed on section moist, succulent surfaces. Fluid exuded from the interstices, obtainable in large amount on slight pressure. This fluid closely resembled serum in its physical and chemical properties; to all intents, it was serum. But the presence of serum in the midst of a mass of tissue is abnormal; it means edema. Edema² is connected with changes in the blood-vascular system, with which, of course, these tumors must have been in direct connection; hence, the application to this transudation of the same explanations which

¹ In no case has the observer ever found anything which could be construed into an epithelial, or endothelial, cell, either in the advanced or elementary stages of geode-formation.

² Wagner: Allgem. Path.

Flint's Practice, Introduction, pp. 33, 34.

Crucetier (op. cit., p. 702) mentions a case where an ante-mortem diagnosis of fibrous tumor of the ovary *with edematous softening* was made. It proved to be a phlebotaxis.

hold good in any portion of the body. But closer inspection disclosed that the edema was not so general as at first appeared. It was confined to small patches, and in certain of these the fluid had coagulated—an unusual condition, if due to circulatory disturbance. Neither did the microscopic appearances strengthen the theory, for, instead of a general, loose, and spongy appearance, such as is seen in the subcutaneous cellular tissue elsewhere, the stroma in general preserved its density and coherence except in isolated spots. Again, though ectasiæ were frequently present, the tissue surrounding the dilated vessels was not as edematous-looking as it was in places remote from the capillaries. Excepting the anomalous state of things mentioned in a few sections of the ovarian cysto-fibroma, there was nothing to direct attention to the blood-system as the cause of the changes, and even there we noted changes in the walls and extensive extravasations, but not resulting edema.

This suggests the additional question, *was this condition edema at all?* understanding by the term the abnormal occurrence of serous fluid *outside* of the vessel in which it normally circulates, or is contained.¹ That it may have been present to a limited extent we cannot deny, but it does not account for the localized softening. It was remarked that each spot of rarefied tissue appeared to be formed independently, and as if by a force acting centrifugally. Everything suggested the accumulation of fluid in the interstices of the fibrous tissue, and remembering the wide distribution of lymph-spaces in similar regions, the inference was natural that the latter were the sources of the initial changes. By examining the very earliest signs of rarefaction, the resemblance between the spaces so formed and interstitial lymph-channels, as figured by the later histologists, was perfect. This fact, taken in connection with the frequent occurrence of leucocytes in the commencing cysts, still further strengthens our suspicion. And when we recall the marked evidences of lymph-stasis and lymphangiectasis (to use the formidable expression of Leopold), found in the cystic tumor first examined, we are ready to say: "Why seek further?"

¹ Cruveilhier, op. cit., p. 680. "These tumors (fibroids) are quite subject to edema, which belongs to the same category as that due to obliteration of veins. This edema may soften the whole tumor," etc. One author actually professes that he has seen dilated lymph-spaces lined with endothelium in direct communication with similarly lined lymph-vessels. We have observed a lymph-vessel apparently communicating with a "geode," but could not trace such a close connection as this writer.

This entire process is simply one of lymphatic dilatation." Referring to the literature of the subject, we see that such has been the course of reasoning pursued by many other observers, and such the deductions made. Yet most of the writers have expressed the utmost confidence in the results obtained, which is quite different from the negative stand taken in this paper. But, briefly, what are the prevailing opinions?

It is significant that a quaint old book¹ published nearly a century and a half ago should contain this passage: "That the Lymph or Milk may produce these Tumors (*i. e.*, fibro-cysts of the uterus), it is necessary that their circulation should be intercepted or impeded. For whilst they freely circulate, they can never form any obstruction." Again, "It appears that the Cist of these Tumors is nothing else but the tunics of the lymphatic Gland or Vessel, or Vesicula lactea of the Uterus, which, though naturally very small, frequently acquires the Bulk of a large Egg through the Ductility, or I may say, Dilatability of the said Tunics; but this should be brought about gradually and without Force, otherwise these thin Membranes, which I may compare to cob-webs, may be burst." The writer has copied this paragraph entire, because it is a remarkable one, expressing only a theory, and yet agreeing wonderfully with the minute investigations of Virchow and Cruveilhier,² conducted many years later with the aids of modern science. It is rather strange that no later writer has referred to the above passage; to the best of our knowledge, it has hitherto been unnoted. Virchow³ had evidently not thought of referring his "cystic metamorphosis" to the above cause, since he merely remarks that "the vessels are often dilated, and there are true exudations, especially of blood—myoma hémocystique."⁴ A great deal has been written about the "corps fibreux à géodes" of Cruveilhier,⁴ so that one finding the frequent references to his work, is prepared to turn thither and find all his doubts dispelled. But, in reality, the originator of the expression is neither clear nor satisfactory in his definition of it. After speaking loosely of the cavities in ovarian fibroids as "kystes aréolaires," he continues: . . . *géodes* qui sont la conséquence de l'œdème dont la liquide infiltré d'abord

¹ Astruc, Dis. of Women, p. 232 et seq.

² Cruveilhier alone was the first to investigate this particular mode of cyst-formation.

³ Op. cit., tome iii., p. 413 et seq. (French trans.).

⁴ Op. cit., p. 689 et seq.

dans l'épaisseur du corps fibreux, se réunit en masse plus ou moins considérable dans une cavité anfractueuse,¹ et dont les parois sont constitués par les lobules dissociés du corps fibreux lui-même." In another place, there is found the expression "areolar or geatiniform cyst," and it is said that, "on first opening these cysts, it looks as if the gelatiniform material was unorganized—the areolar structure comes out on careful examination."

This mysterious appearance, we have seen, is due to nothing more nor less than coagula of fibrin. What impression can we derive from this, except that the pure speculation of old Astruc carried him nearer to the ultima causa than the practical investigations of the eminent French pathologist? We shall not delay to quote statements which are simply borrowed or unsupported by facts. Péan,² writing at a somewhat later date, refers to the origin of uterine fibro-cysts from dilatation of the lymphatics, and opposes the theory. This proves that it must have been started before. Occasional references are indeed made to this method of cyst-origin, but Leopold³ is the first contemporaneous writer who resumes the subject as if he meant to study it thoroughly. His earlier exhaustive papers on normal lymph-distribution⁴ entitle him to greater consideration than any one who has preceded him. His views are briefly these: The cysts within the "lymphangioma kystomatosum" arise from a dilatation of the lymph-spaces, due to an obstruction of the channels, the fluid accumulating and forcing asunder the tissue. The ultimate cause of this obstruction may be a sort of "axendrehung" of the pedicle of the tumor, through which the large lymphatics run.

Later he reports what he considers a test case, wherein "these spaces look like the normal lymph-spaces of the uterus," but he confuses the question by claiming for "venous stasis,"

¹ A very appropriate term, as will appear from reference to the drawings.

² Péan et Urdy "Hystérotomie," chapter iii., p. 82 et seq.

To again quote Klebs, "In a like hyperplastic way can the vessels of the fibro-myoma develop: the lymph-spaces dilate to *smooth-walled* cysts, *destitute of a special membrane*, and filled with clear limpid fluid . . . simple cysts of considerable size are known, which are surrounded on all sides by muscular substance . . . a softening of the walls seems to have introduced the enlargement of the cystic lymph-spaces, etc."

³ Arch. f. Gyn., Bd. vi., 1874, p. 189; also Bd. vii., 1875. Report of cases of "myosarcoma lymphangiectodes," by Fehling u. Leopold.

⁴ Id., Bd. iv.

"edema," "myxomatous degeneration," etc., a share in the formation of cysts. We do not doubt the occurrence of the first two conditions (or rather of edema, resulting from stasis), but why mention them only to divert the reader's attention from the main issue?

Rein,¹ following the course indicated by Leopold, has given the most complete description of commencing cysts which the writer has yet seen, and one which corresponds closely with the appearances already mentioned. But when we read that some spaces were lined by "eine ununterbrochene Schicht von Endothelzellen," we must confess that he has been more highly favored in his studies than we. Naturally the only inference to draw from such a condition (real or fancied) was the one stated by Rein, viz.: These spaces are lined with endothelial cells, hence they must come from dilatation either of lymphatic- or blood-vessels. But the latter are observed throughout the specimen to be of regular form and sharply separated from the rest of the tissue, while the "Hohlräume" are irregular and their boundaries ill-defined. Moreover no blood-corpuscles are found in them. Hence they must arise from dilated lymph-spaces.² There is a doubt in the writer's mind as to what Rein understands by a "lymph-space." If the modern theory is accepted (and too much careful work has been put upon the histology of the lymphatics to admit of doubt that the interstices of connective tissue form one vast series of intercommunicating lymph-channels), it is not correct to say that every such space is lined by endothelium. This may apply to the vessels with regular walls, but hardly to the irregular spaces.³ Furthermore, it is strange that neither Leopold nor Rein has noted the occurrence of circum-

¹ "Lymphangiectatic Fibromyomata." Arch. f. Gyn., Bd. ix., 1876.

Leopold (Arch. für Heilkunde, 1873, p. 44) in reporting a case of uterine fibro-cyst, says: "In many places are seen fine vessels with endothelial-lined walls. In some places adjacent capillaries are fused together by melting away of their walls." Ampullæ are found in places. "Es scheint als ob in jener hellen Schicht sich aus feinsten Capillären die ersten Anfänge der Cavernen bilden." The cavities are lined with endothelium, hence they come from dilated vessels. As said before, these appearances have been rarely observed.

² Rein explains that only the "youngest" spaces had an endothelial lining. In the walls of the older ones there was often found fatty degeneration (!).

³ Leopold takes a contrary view. This subject is still too little understood to admit of positive assertions.

scribed collections of leucocytes,¹ which (excluding inflammations, and diapedesis from temporary capillary stasis) certainly points to some disturbance in the circulation; nor has either of these writers mentioned the frequent presence of lymphoid cells within the coagula which fill the interior of freshly-cut geodes.

This has brought us back to the original point to which our own investigations led us, and, to tell the truth, not much farther. There still remains the possibility that the so-called "edematous patches" are not due to edema,² but to lymphangiectasis (either spaces, or true vessels, or both, being affected); credible witnesses testify to the truth of this, saying that they have observed the process in its very inception, as it were. Yet the verdict not proven is the only one which can conscientiously be given, and this is the conclusion to which the writer's honest endeavors to find the truth have brought him. Having disposed (unsatisfactorily, it is true) of the etiology of geode-formation, we are prepared to trace briefly the growth of the resulting cysts.

We shall employ the theory of lymphatic dilatation as the most plausible one, though regarding it as but a theory. We have seen how the microscopic spot of softening gradually extended, chiefly as the result of the pressure from within, partly, doubtless, by the infiltration and softening of the neighboring tissue. A true general edema may assist in the latter process. The coarse network of fibrous tissue became finer and finer, the meshes farther apart, as they yielded to the separating force of the contained fluid, until finally the interlacing fibres were torn

¹ Since writing the above the following passage was read in Klebs (op. cit., Tome ii., p. 822). In speaking of a sarcoma of the ovary he says, "it often contains spaces filled with gelatiniform fluid, rich in lymph-cells."

Leopold (Lymphgefäße des normalen, nicht-schwangeren Uterus) thinks that the smaller muscular bundles are covered with fine veils of endothelium, and hence every lymph-space, no matter how small, must be lined with endothelial cells. His observations, it is unnecessary to say, were made upon *fresh* tissues. The point is a very delicate and doubtful one.

² Leopold (loc. cit.) also claims by induction of artificial edema, to have brought out a complete network of endothelial cells running throughout the tissues (of the uterus) and connecting by branching processes with the corresponding cells lining the lymph-vessels proper. It would be well if such thorough investigations were instituted in the normal ovary, yet the analogy between the two organs is close enough to furnish material for a pretty theory.

asunder and a small cavity was formed. Having overcome the first obstacle, we observed that the spaces rapidly increased in size, as the fluid accumulated in larger amount, and at the same time there were evidences (in the most advanced "geode" examined) that the tissue along the edges of the open space was becoming more condensed by reason of the long-continued pressure. Fibres and spindle-cells arranged themselves in rows more or less parallel, and the first suggestions of a limiting wall appeared. At the beginning of this division of the subject, attention was called to certain vascular peculiarities in the vicinity of commencing cysts. It is fair to infer that any influence which causes a lymph-stasis will also interfere with the capillary circulation, and hence edema, extravasations, etc., which act as secondary agents in promoting the rapid expansion of the growing spaces; a sudden accession of fluid, such as might come from the rupture of an adjacent capillary, would greatly increase the pressure upon the sides of the cavity, and serve both to extend its limits and to condense the surrounding tissue. There at length comes a time when we may dignify this cavity by the name "cyst,"¹ and call its contiguous tissue a "wall." When

Wilks (Trans. London Path. Soc., vol. ix., p. 299) presented a fibro-cyst (ovarian) before the London Path. Society, upon which a committee of eminent pathologists submitted a report. They decided (1) That it was impossible, from the difficulty in isolating them, to decide as to the presence or absence of smooth muscle-fibres. (2) The *size* of the tumor and its relation to the *ovary and tube* are the most important diagnostic points. (3) "The walls of the cysts have the same structure as the solid tissue of the tumor; the only difference being that the fibres are arranged with greater regularity and often appear to form *parallel* bundles, a difference depending probably upon the *stretching to which the parts have* been subjected by the distention of the cyst by fluid." It will be seen that the above deductions correspond closely with those obtained from our studies.

¹ Comp. Gusserow, who says of these cavities "sie sind einfache Gewebslücken, keine wirklichen Cysten" (op. cit.).

Consulting his notes, made at the time of observation, the writer finds reports of various interesting tumors, for example: Case I, Fibro-cyst of uterus (removed by Dr. Thomas, Woman's Hospital, July 6th, 1881). It is filled with small cysts which *do not communicate* (as was the case in one of Waldeyer's cases). Contents pale-yellow, specific gravity 1025; spontaneously coagulable. Hemorrhages seen on section. In some places the tissue presents a curious honey-combed appearance. Many blood-vessels and lymphatics immensely dilated. *No trace of epithelial lining* in commencing or advanced cysts. Smaller cavities filled with coagulated fibrin; many "geodes" surrounded by dilated vessels. Case II. Tumor right ovary; malignant? (Emmet, Woman's Hospital, May 20th, 1877). Same appearance of "geodes" packed with leucocytes and blood-corpuscles. Note

this transition period is passed, our sections have not informed us. Cysts have been mentioned in ovarian fibromata not larger than an acorn; doubtless a careful examination of such small cavities would furnish valuable results. The only one which the writer ever thought that he had found proved to be a cystic ovary, with advanced fibroid thickening. Having reached the cystic stage it becomes a familiar pathological object, and does not need further elucidation, since it has been thoroughly described by authors. When the *eccentric* changes, thus far spoken of, have reached a certain degree, those of a *concentric* nature begin. Such are, softening and maceration of the wall from long bathing in the contained fluid, anemic necrosis of the same from sustained pressure, repeated hemorrhages by rupture of mural vessels or diapedesis. To these may be added granular and fatty degeneration, and (a rare change) hyaline degeneration. The writer can hardly refrain from mentioning this latter condition, observed in the wall of an advanced cyst, in connection with the hyaline metamorphosis in the walls of the blood-vessels. The relation is just about as clear as that between the endothelium lining a lymph-vessel, and the cellular layer which is thought by some to cover the wall of a fibro-cyst.¹ Thus by gradual growth, and as the combined result of various forces, arise the immense cystic formations, which bear within their interior traces of the successive changes to which they have been subject. Sections through their walls, in all specimens seen by the writer,

curious staining of coagula within the cavities, looking very much like hyaline metamorphosis. The basis of the tumor consists of loose tissue with branching cells, in many places full of leucocytes. Probably cancer? *No epithelial lining to cysts.*

Case III. Cysto-sarcoma of ovary (Sims' private case, April 4th, 1880). Cannot distinguish many sections from normal stroma. The *angiomatous* tendency of the tumor is marked. General lymphatic thrombosis; numerous dilated vessels, also cavities containing fibrin network: holding in its meshes blood-corpuscles and leucocytes. General diapedesis of blood-cells. *No trace of epithelial lining to cysts*, the only wall being the condensed tissue, with spindle-cells arranged in parallel rows. Tissue throughout very fine and dense.

Case IV. Large fibro-cyst of uterus (Bozeman, Woman's Hospital), same general structure as in other case. "Geodes" few in number and *without epithelial lining*. Large old central cyst with degeneration of walls.

¹ Which cells have never been found, either in the fluids, scrapings, or hardened sections of the specimens examined by the writer (five in all). Comp. also Gusserow (op. cit.), who denies an endothelial lining to these cysts.

show dense, parallel fibres, which give the impression of having been firmly crowded together by a force acting from within the cavity, since, a short distance away from the wall, the tissue assumed its ordinary appearance.¹

A discussion as to whether a cellular lining is ever present in this variety of cysts would be unprofitable, considering the great difference of opinion which exists. Many statements have been made by reliable observers to the effect that such is the case. To quote only one—so great an authority as Waldeyer² reports a fibrous tumor of the ovary containing two small cysts (the size of walnuts), lined by “low, cylindrical epithelium.” “Nowhere else,” he adds, “was epithelium to be found. Hence these formed *the only remains of the epithelial parts of the ovary.*”

This deduction, to be expected in one who had already laid such stress on the development of the cystomata from embryonal epithelium,³ was made before the lymphangiectatic doctrine of Leopold was elaborated. If cells were found at all, we should expect them only in such young cysts as the ones above mentioned, where we should regard them as either pointing to a true vascular dilatation, or as marking the (hypothetical) “*follicules hydropiques*” of Virchow. The writer does not feel prepared to offer an opinion upon this question, not having made a sufficient number of observations. He has never been fortunate enough to discover a single endothelial or cylindrical epithelial cell in the interior of these cysts at any stage of their growth or decay. As to their occurrence in the older ones, it can only be said that this is contrary to what we should expect. In a wall, subject to degenerative processes itself, and in long contact with a fluid, we cannot think it probable that a delicate cellular membrane would be preserved, when the firm fibrous basis upon which it is seated cannot withstand the pressure. And that this lining epithelium should persist all through the life of the cyst, from its earliest beginning as a dilated lymph-vessel, up to a cavity ten thousand times the dimensions of the original, is a supposition so contrary to the facts which we have observed

¹ Dupuytren has compared these cavities, not inappropriately, to the cavities of the heart (Virchow, “*Tumeurs*” Tome iii., p. 390). Virchow distinctly says that “fibro-cysts of the uterus have *no lining membrane.*”

² *Archiv f. Gyn.*, Bd. ii., p. 440.

³ Vide “*Eierstock u. Ei.*” “*Eierstockskystome,*” *Arch. f. Gyn.*, Bd. i., S. 252. Also Malassez et de Sinéty, *Arch. de Physiol.*, 1878, i. and iv.

elsewhere,¹ that we consider it untenable. A great deal has been said, especially by clinicians, upon the contents of fibrocysts and their value in differential diagnosis; doubtless too great stress has been laid upon this point, as also upon the examination of suspected ovarian fluids.²

Until a "geode" has reached a certain size, or until its contents have become mingled with products of disintegration or blood-extravasation, the writer has always found a clear serous liquid, spontaneously coagulable on exposure to the air.³ In fact, he received but one specimen in which the coagulation had not already taken place, and hence the peculiar semi-solid patches which have always been so mysterious to microscopists—the "gelatiniform," "mucoid," "myxomatous," "colloid," metamorphosis of authors.⁴ Acetic acid gave no mucin reaction in the above spots. This is different from Gusserow's⁵ experience, who states that the fluid found in the interstitial tissue of fibroids *does* contain mucin. However, he evidently makes a distinction between these spaces and true "geodes," for he speaks farther on of the latter as "filled with a fluid which

¹ In various cystomata of the ovary, from the lining wall of which the epithelium is often missing, as the result of retrograde processes.

² Vide Drysdale's original paper in Trans. Am. Med. Ass'n in 1873. Also Garrigues (AM. JOURN. OF OBSTET., January, 1882), who gives the literature of the subject. Westphal in particular is a thorough observer, Arch. f. Gyn., Bd. viii., 1875.

³ Most of the specimens obtained from the Woman's Hospital were not examined till the day following their removal by operation.

⁴ Garrigues (New York Medical Record, March, 1882) states that he noticed no clot in the fluid of these small cysts after standing two days (!). The writer found clots within the "geodes" of the same specimen.

Noeggerath suggests that this property of coagulation is only due to admixture of the cyst-contents with *blood*. Garrigues, on the contrary, has seen absence of coagulation even with bloody fluid.

⁵ Neubildungen des Uterus, p. 102. He also speaks of nucleated round cells contained within these spaces.

Koeberlé (Gazette Hebdom., 1869, p. 136 et seq.)—"Only fourteen cases of ovarian cysto-fibromata reported up to this time (1869)." Fluid coagulates spontaneously on exposure to air. Koeberlé says positively that these cysts are of *lymphatic* origin.

Schmidt (Schmidt's Jahrb., 1866, p. 129) describes an "Erweichung durch Oedem," which gives rise to the "geodes" of Cruveilhier, and distinguishes cavities thus formed from "Pseudocysten, die sich durch Erweichung fester Fibroidmassen bilden." The former are often lined with epithelium. This article is as obscure as it is exhaustive, and leaves in the reader's mind the opinion that the author has not adhered closely to his divisions of the subject.

resembles lymph chemically, and in fact *is* lymph; this fluid coagulates spontaneously on standing, etc." Spiegelberg examined such fluid, and found that it contained serum-albumin, but no mucin or paralbumin.¹ Gusserow later obtained a similar result. When we come to the larger cysts, we find fluid of a less homogeneous character, and containing various foreign elements. Without going into the interesting matter of differential diagnosis, the writer would simply state as his opinion that it is impossible in the present state of medical science to infer that an abdominal tumor is of a fibro-cystic nature, from an examination of one, or several specimens, of fluid. Our studies thus far have shown us that, after a certain time, the cyst-contents lose their original characteristics; how, then, can we lay much stress upon their physical and chemical properties? "The fluid is transparent(?), of a deep-amber color, and very thin when first drawn, but forms a hard and firm coagulum in a little while, which in a few hours shrinks, and separates into a clot and a thin watery serum. It coagulates by heat, and resembles in every respect the liquor sanguinis. Under the microscope, few cells appear in it. There are epithelium,² oil-globules, and a fibre-cell. This (*i. e.*, the fibre-cell) is a characteristic of the structure in which the cyst originated." The above paragraph, copied verbatim from an eminent authority³ on gynecology, gives a fair clinical view of the question. Yet any pathologist, having simply the above data, would be very bold indeed to offer a positive opinion. The "fibre-cell of Atlee"⁴ has not yet attracted much attention; indeed, it occupies about the same position as the "grouped cells" of Thornton.⁵ Until Dry-

¹ Oskar Schröder (Inaugural Dis., 1872)—"Cysto-fibroids des Uterus"—could not detect mucin. He urges the spontaneous coagulation of the fluid as a diagnostic point.

Heer (Inaugural Dis., Zürich)—"Ueber Fibro-Cysten des Uterus." In a very superficial and disappointing paper, he merely touches on the examination of cyst-fluid by the coagulation and heat-test. He attempts no explanation of cyst-formation.

² Note the word "epithelium"—a most misleading point on which to found a diagnosis.

Atlee is rather sanguine about the value of examinations of doubtful fluids, yet he looks at the subject from a clinical, rather than pathological, stand-point.

³ Thomas, *Dis. of Women*, last ed., p. 557.

⁴ Vide Atlee, "Ovarian Tumors," p. 263.

⁵ The writer has examined two specimens of fluid containing "grouped cells," and seen the ante-mortem diagnosis of cancer confirmed by autopsy.

dale's corpuscle¹ has had its identity firmly established, it seems to be only multiplying theories to bring forward fresh examples of so-called pathognomonic cells. The writer has not seen the appearance which Atlee mentions, except in commencing cysts, where he regarded it as an ordinary spindle-cell. In the mixed fluid of an advanced cyst, with degenerated walls, it seems improbable that such an element should preserve its integrity.

It may have seemed all through the course of the argument as if the writer, while dwelling upon the theory of lymphatic dilatation, had carefully avoided any suggestion concerning the cause of the assumed stasis. This is just where the weak side of the whole question appears, and unfortunately little can be done to strengthen it. The theory had no sooner been advanced in the first place than the same objection was raised.² If the writer has asserted that there was present in the specimens examined evidence of interference with the circulation in the morbid growths, it was because he observed the same appearance here which obtains elsewhere, under known conditions of obstruction. Whether the inference was correct or not, of course we cannot tell. It is equally true that it cannot be proved to be incorrect. Hence, as we must employ a theory to explain those morbid processes for which we can discover no sure cause, the most plausible one is certainly to be preferred.

In the case of uterine fibro-cysts, the accumulation of lymph was attributed to "pressure upon the afferent vessels through the increased growth of the tumor." "Axendrehung," or twisting of the pedicle, was suggested by Leopold (an old idea, opposed by Péan, who examined fibro-cysts, having long, slender pedicles without the least signs of strangulation of the vessels), fibrous thickening of the pedicle by another. Contraction of the capsule, old adhesions,³ general disturbances of the sys-

¹ Fluids from a true peritoneal cyst, cyst of the spleen, etc., have yielded Drysdale's corpuscles on careful examination.

Few will agree with Dr. Thomas in his confidence in Foulis and Thornton's pathognomonic cells. Garrigues (loc. cit. in AM. JOURN. OBSTET.) refers to the "grouped cells." The writer has studied them, but without definite results; in his opinion, observations are as yet too few to lead to any valuable deductions.

Rein suggests that one should plunge a trocar deeply into the tumor, in order to avoid admixture of the fluid with blood. He denies that a true "fibroma lymphangiectodes" has ever been found in the ovary.

² Vide Péan, loc. cit.

³ Leopold (loc. cit.) says that adhesions are not common in the case of

temic blood- and lymph-circulation—all of these external agencies have been invoked to account for the intrinsic changes. The writer does not hazard another guess, but would call attention to the fact that these tumors are made up of contractile elements; that they are subject to well-known changes in size, and that there is no reason why local circumscribed contractions should not be constantly occurring, such as would compress the delicate vessels and lymph-spaces, giving rise to temporary stasis.¹ However that may be, the specimens obtained by operation and autopsy have merely confirmed the supposition that there was an impediment to the vascular supply in the pedicle. And the conditions suggested are even less likely to be present in the case of fibromata of the ovary. To tell the truth, the entire subject of lymphatic distribution and the mode of circulation of the lymph through its various channels, has still a veil of mystery hanging about it. The physiology of this vast system being so imperfect, what wonder that its pathology is obscure?²

ovarian fibroids. The pedicle is generally short and broad, with free vascular communications. The tube lies free from the tumor.

There is no evidence that the causes suggested were actually observed on autopsy. Van Buren was one of the first to call attention to the twisting of the pedicle in abdominal tumors. Later writers frequently refer to his early cases (1850). The writer has never (in upwards of fifty cases) seen an instance where any interference with the vascular supply in the pedicle could be suspected.

It is certainly not without reason that we should imagine the presence of local adhesions around these tumors or circumscribed inflammation of the capsule, such as would constrict the vessels. Such, however, the writer has never heard mentioned.

¹ It is unnecessary to quote cases to prove the changes in size which may occur in fibroids under various influences—pregnancy, ergotin injections, etc. These cannot be explained by variations in the calibre of the *vessels* alone. Doubtless this local contraction within such tumors will explain many otherwise inexplicable cases of necrotic softening.

² The suggestion of Leopold that the accumulation of lymph within fibroids may act as a drain upon the general system is amusing. How much lymph is removed from the general circulation, and what means have we of knowing anything about it?

The subject of "Lymphatic Dilatation," as a surgical disease, is very limited. A few cases are reported in old numbers of the *Lancet*, for which no cause could be ascertained. Handfield Jones (*Lancet*, Vol. ii., 1875) cites one in which he considered that the *lymph-spaces* themselves were affected. In no instance was the thoracic duct compressed.

Wedl (Virch. Arch., No. 75), in an article on Thrombose der Lymphgefäße der äusseren Haut bei Carcinoma Mammæ, observed the interstices of the tissues to be crowded with lymphoid cells (as in my speci-

Some confusion has been caused among writers by the description of another variety of cystic growth, called loosely "areolar," "fibrous," "hypertrophic" cysts, or "cysts with fibrous thickening." It is quite unnecessary to place these in a separate class; still less to regard them as having any connection with the subject of this paper. They are merely ordinary ovarian cystomata, in the walls of which there has occurred an overgrowth of fibrous tissue, so that on section one is reminded of the dense, parallel fibres, which are so familiar, lining the cavities in fibromata. The writer has examined the thickened walls of multilocular cysts, and has found nothing to indicate a difference between them,¹ and the parietes of other cystomata. For, 1, the contained fluid is identical; 2, the fibrous increase is always limited and in spots; 3, numerous secondary cysts are found without thickened walls; 4, at some point the distinctive epithelial lining will be preserved; 5, the *tout ensemble* of the tumor will prove its origin.²

At this point the writer will be obliged to conclude a paper of the indefinite and unsatisfactory results of which he is clearly aware. The subject was a difficult one to begin with, his own training in the use of the microscope imperfect, and his judgment naturally immature. In trying to preserve an independent attitude towards previous observers, he may have assumed an apparent self-confidence which he is far from possessing. As was stated in the introduction, he did not set out with the idea of making any new and original observations, nor has he done so. Unbiased by the weighty opinions of eminent authorities, he could not pretend to be, yet from his own personal observations, as set forth in the preceding pages, the following deductions may be drawn:—

1. Fibrous tumors may, and do, arise from the ovary, independent of the uterus or the other adnexa.

mens), and he thought that he detected a true out-wandering from the lymph-vessels themselves.

Foà (id., vol. 62) demonstrated by injections the close relation between the vessels and extra-vascular lymph-spaces. By injecting the bulbous aorta in a frog, he obtained under moderate pressure injection and dilatation of the spaces.

¹ Gallez, in particular, has noted a separate class of "fibrous cysts." It is to be remarked that Thomas, in his last edition, also calls attention to the difference between these and true cysto-fibromata.

² The writer once found extensive fibroid thickening in a very young cyst. But its association with other cystic formations and the remains of the ovary showed its origin.

2. In structure these tumors are true fibromata, yet peculiarly rich in long spindle-cells, which closely resemble those of the normal stroma; hence,

3. These fibromata originate, not by a local change, but as the result of a general hyperplasia of the ovarian stroma. Moreover, there is nothing to show that this process is of an irritative, or inflammatory, character.

4. The resemblance between microscopic sections of ovarian and uterine fibroids is so close that the differential diagnosis is very difficult, if not impossible.

5. Cysto-fibromata of the ovary, like those of the uterus, are of secondary formation, and result from changes in previously solid tumors.

6. Such cysts probably arise from the so-called "geodes" or "gelatinous patches."

7. These "geodes" do not represent any form of degeneration at all, but are dilated connective-tissue spaces, filled with a coagulable serous fluid, resembling lymph.

8. The "geodes" are probably dilated lymph-spaces, which expand by reason of the accumulated fluid in their interiors—a condition due to a general stasis.

9. That *lymph-spaces* rather than *lymph-vessels* are the seat of these changes is evidenced by their irregular shape, intimate relation with the surrounding tissue, manner of dilatation, and absence of endothelial lining. But that the proper vessels may also dilate in like manner is not improbable.¹

10. Simultaneously with the lymph-stasis, there often exists a disturbance of the blood circulation, giving rise to edema, extravasation, and various local changes, but these are factors in the *subsequent growth*, not in the *origin* of a "geode."

11. Commencing cysts grow by increase of the contained lymph, by accessions of blood and serum from adjacent vessels, and by degeneration of the surrounding tissue.

12. At no time in its history does a cyst possess a proper wall, since what at first appears to be such is merely the surrounding fibrous basis of the tumor, condensed by long pressure. A cellular lining upon the apparent wall of a fully developed cyst (originating like those referred to in this paper) is certainly very rare in a young growth, and highly improbable in the case of one of advanced age.

¹ Comp. the "Ampullæ" observed by Leopold.

13. The fluid found in these cavities has originally the properties of lymph, but becomes so changed by intermixture with other elements, that its examination for clinical purposes does not furnish positive results.

14. The *ultima causa* of dilatation of the lymph-channels and consequent cyst-formation in fibroid tumors is unknown. Clinical observations lead to the inference that, in many cases, the active influences are *within* the growth itself.

During the composition of the first part of this paper, a new light was thrown upon the subject by the examination of a small ovarian tumor, received immediately after removal.¹ It was a little smaller than an English walnut, smooth and lobulated, possessed a well-marked capsule, and a long, slender attachment which looked like a pedicle. It was doughy to the feel, and on section showed a soft, homogeneous, non-fibrous structure. Exactly in the centre of the mass was an exquisite little cyst, not larger than a pea, with a perfectly defined wall and a clear serous contents. Examination of the fluid yielded numerous groups of cells of an endothelial nature, a few blood-corpuscles and lymphoid cells, and clumps of very delicate interlacing fibrillæ, not to be distinguish from coagulated fibrin. Several scrapings from the (fresh) wall gave the same result, with the addition of cells closely resembling pavement epithelium. The fresh tumor was now injected with Berlin blue, the needle

In their clinical aspects, fibromata and cysto-fibromata rank with other solid tumors of the ovary, the cystic variety being of more importance from their larger size. The necessity for operative interference not rarely occurs (Spiegelberg reports an ovarian fibroid of eighty pounds weight). The diagnosis could only be made by exclusion, and would not be positive. A benignant tumor might be reasonably suspected in the absence of the usual signs pointing to carcinoma or sarcoma (vide cases of Atlee and Peaslee; Van Buren in N. Y. Med. Journ., 1850, vol. i., p. 159).

Thomas (Am. Jour. Med. Sci., vol. lxxi.), Double Ovariectomy—Rare Case of Adenoma Ovarii.

It will be understood that this is not a *clinical*, but a *pathological*, study. The same rules as to differential diagnosis and treatment apply here as in the case of other abdominal tumors (vide Olshausen, Spencer Wells, Atlee, Peaslee, et al.).

¹ Kindly sent by Dr. Thomas; removed from private patient. On opening the abdomen, general cancerous disease of the omentum was discovered and the wound was closed, only this ovary being removed. Whether the disease was primary or secondary in the ovary is not certain, probably the latter. (Indebted to Dr. Welch for the specimen.)

of the syringe being introduced quite superficially beneath the capsule. Under moderate pressure a beautiful net-work of lymphatics burst into view near the point of insertion, and at the same time a similar injection was seen on the inside of the cyst-wall. The same result was obtained in two trials. A natural inference was, that here was a cyst, with a regular endothelial lining, in direct connection with the lymphatic system, hence a dilated lymphatic, surprised in the very act. But unfortunately for the integrity of the theory, on hardening the specimen, and making sections through different parts of it, it was found to be distinctly cancerous in nature, though the alveoli were quite small and distributed in a curiously irregular way. Some of them were in the immediate vicinity of the cyst, one in particular invading its wall. No cell-lining to the cyst could be discovered, so that the probability is that the cells found in the fresh fluid and scrapings had escaped from the alveoli. The stroma of the tumor was generally myxomatous, except around the cyst, where parallel rows of spindle-cells were seen in the midst of fibrous tissue. Sections through the cavity itself proved that the injection had indeed penetrated through the entire thickness of the mass by means of the lymphatic channels. In some places the coloring was general and not sharply defined, probably where it filled interstitial spaces, but at the very edge of the cavity there was a clearly marked branching vessel, such as those figured by Leopold and Recklinghausen. No endothelial lining was brought out in these vessels by the method of staining employed. Although this tumor did not belong to the class which we have been studying, it has been mentioned because of the opportunity which was afforded for testing the results of injection in the fresh specimen. Doubtless the relation of the lymphatics is the same as in the benignant growths. We hope some day to have an opportunity of confirming in this way the statements of authors with regard to the "fibroma lymphangiectodes."¹

¹ In the writer's opinion, future investigations will be most valuable according as they are made by means of *careful injections of fresh* tumors. Only by establishing *positively* the relation between the dilated spaces and the lymphatic system, can we hope to clear up the doubtful origin of the commencing cysts.

A NEW PROCESS FOR LIGATURE AND DRAINAGE IN ABLATION OF THE UTERUS THROUGH THE CERVIX.

BY

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(With two woodcuts.)

THE mooted question of a proper disposition of the stump after an excision of the womb through its neck seems to me to be satisfactorily resolved by ligating the part around a tube, which shall serve to carry away any accumulation within the cavity of the abdomen, whether of oozing of blood subsequent to the closure of the wound in its walls, or by serous fluid or purulent collections subsequently.

In operations at full term of pregnancy or in premature contraction of the womb with consequent dilatation to a greater or lesser extent of the cervix uteri, the proposed plan is especially applicable, but in all cases of dilatability of the neck of the womb, which admit of the introduction of a tube with a diameter of one-fourth of an inch, it may be resorted to advantageously, though a tube of larger calibre is advisable ordinarily for effective evacuation. The tube of silver with a thickness of one line (one-twelfth inch) and diameter of half an inch, having a length of an inch and a half, has a slight circular depression at a distance of one-fourth of an inch from the upper extremity into which the ligature is tied so as not to slip from its position until it is desirable to take it away. At the lower and on each side of the opening there are attached, through small holes, the extremities of a loop of silver wire, which should, when doubled together, have a length of at least twelve inches. When the operation has proceeded to the point of preparation to apply the ligature, whether it be of silk or silver wire, around the pedicle to be left, this silver tube should be placed upon the point of a curved guide having a shoulder at a distance of an inch from its extremity, to arrest its further entrance into the tube, and with a handle reaching at least six inches from the curve, is grasped by a competent assistant, who

is charged with the introduction of the tube through the vaginal canal into the neck of the womb.

When the operator perceives that the upper end of the tube has reached the os internum, he directs it to be kept steadily in

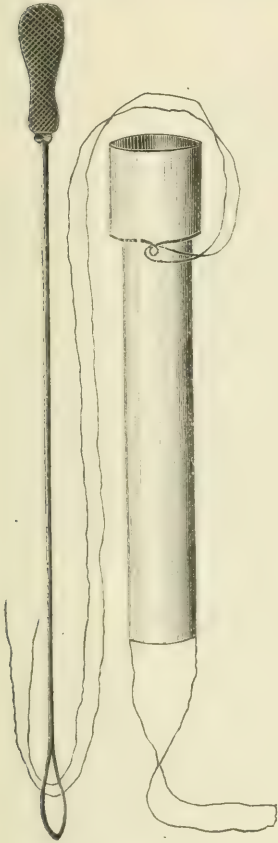


FIG. 1.

FIG. 1.—Silver drainage tube armed with ligature ready for passage through canal of cervical stump.

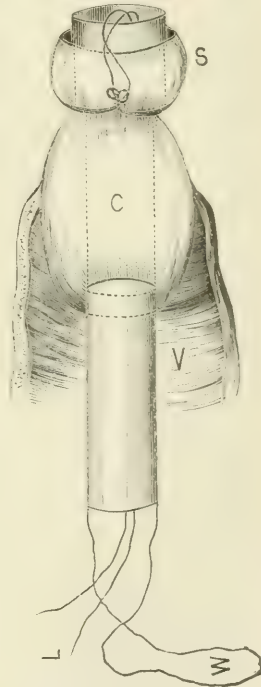


FIG. 2.

FIG. 2.—Drainage tube in cervical stump. V, vagina; C, cervix; S, stump; L, ligature; W, wire attached to tube.

this position, while the ligature of strong and large silk cord is securely tied around in the groove, one-fourth of an inch from the upper end. Should there be any doubt as to the exact size of the groove, the tube is to be gradually moved up by the assistant, or down by the finger of the operator, pressing on the

upper end through the tissues until the ligature rests certainly in it, when the knot should be well secured, leaving both ends of the ligature with a length of twelve inches. The pedicle being thus securely encircled by the ligature around the tube, there can be no liability to doubt as to a complete arrest of the circulation of blood through the constricted tissues. The knife should now be applied at a distance of half an inch above the ligature, thus allowing one-fourth of an inch above the upper extremity of the tube, which by contraction may be expected to remain on a level with its margin.

The assistant now withdraws the staff or guide from the lower opening of the tube, and the two ends of the ligature being cut to exactly the same length of twelve inches from the knot of the part which encircles the pedicle, are passed down through the tube and a knot thrown upon their united extremities, which are secured by a tape to the thigh of the patient, marking the extent of the length of their protrusion from the outer aperture of the canal. The vagina is now to be plugged with a sponge of a convenient shape and size, wrung out of a ten-per-cent solution of carbolic acid, the upper part being in contact with the lower opening of the tube, and the lower retained within the sphincter vaginae so that the vulva shall close accurately, and the labia be kept in apposition by cloths moderately impregnated with weak carbolized oil. A cord being previously passed longitudinally, and looped so as to be readily caught over the point of the index finger, the sponge in the vaginal canal is to be removed daily, and a sponge-tent fixed to the end of a staff plugs up the lower end of the tube immediately upon its withdrawal. With these precautions, a Davidson syringe is used to inject a warm five-per-cent solution of carbolized water into the vagina, so as to clean it of all impurities. The vaginal sponge, prepared as stated already, is replaced, while the plug is retained in the tube by the staff, and only removed after the former is properly adjusted. Should the progress of the case indicate any offensive discharge into the sponge, fresh sponges are to be applied night and morning, but during the first three or four days a daily change will suffice for cleansing the parts.

At the termination of six days, it may be inferred that the separation of the upper border or circle of tissues above the

ligature is in a condition to be detached, and if all has proceeded satisfactorily, the ligature will be lying loose around the tube, so that gentle traction upon the wire loop which is secured to the lower end of the tube, should be made, while the sponge-tent plug is placed in the lower opening of the tube.

If it is found that the tube descends with slight traction to the extent of a quarter of an inch, which is determined by placing the index-finger of the left hand in contact with the os externum and the outer surface of the tube, it will be proper to retain the tube in its new relations, by the point of the finger already placed in contact with it; and instead of now drawing further upon the metallic loop, make traction gently upon the protruding ends of the ligature, so as to bring it down with the contained fragments of tissues through the tube.

As the ends of the ligature which pass through it pass through the circular border of the tissue at the upper part of the cervix, and also through the loop formed by the knot originally made, it will necessarily bring away the disorganized mass in the noose thus formed, and it is evident that this step should not be delayed beyond the period at which the separation may be safely effected. This being accomplished, the sponge-tent plug, which has been supplied or substituted by the point of the index-finger of the left hand, is to be fitted again into the lower opening of the tube, and the injection repeated with the carbolized water into the vaginal canal. If the hand of the assistant which secures the staff of the plug is rested firmly in the loop of the silver wire attached to the lower margin of the tube, and at the same time placed steadily in contact with the vulva, the tube may be kept accurately *in situ* during the manipulations of washing out the vaginal canal and replacing the sponge back in the vagina, after the ligature has come away through the tube.

The tube should be allowed to descend day by day a little, so that the granulating border above may gradually close over it, and in the end it will escape from the cervix, and all further injections should be made with the sponge tent plug placed in the orifice of the rudimentary external os uteri.

It may not be irrelevant to state that the silver wire loop attached to the lower end of the tube should be retained from

the outset at a fixed point below, so as to obviate any possible slipping upward of the tube and its escape into the cavity of the abdomen.

All will concede that this mode of ligation must effectually obviate hemorrhage of a secondary character, and that the drainage tube thus used should prevent septicemia.

Notes upon securing pedicle and draining cavity in excision of womb, as adopted for inferior animals, will now be presented. The first application of this mode of ligation and drainage occurred in the case of a fine mare owned by my uncle, Mr. Thomas Fadden, at his farm twenty miles distant from the city.

This animal being on the eve of delivery, threw herself violently upon the paving of the barnyard, and something was heard by the groom of an unusual nature within the mare's belly, from which time she manifested great distress, and yet there was no progress toward foaling.

It being known that my gynecological tastes would induce me to take an interest in the result, a telegram was immediately dispatched, and within an hour, this being about three hours after the occurrence above noted, I was duly installed as veterinary accoucheur. The patient was already lying upon the left side, with her body somewhat turned toward a back position, and the fore and hind legs secured separately by cords; vaginal examination, passing the entire arm within the canal, revealed rupture of the womb and the escape of the foal into the abdominal space beyond, while the placenta was retained in the uterine cavity by adhesion to its walls.

Recalling the result of Porro's first case during the previous year, I proceeded, on the 4th of April, 1877, to open the abdominal wall in the median line, commencing at a distance of ten inches from the pubic bone, and extending the incision forward for a similar distance, so that upon the introduction of the hand it encountered the foal with the ruptured membranes partially investing it. Seizing the nose of the colt in my right hand, it was then drawn through the outer opening, and being secured by a noose of cord, an assistant, in the person of the groom, drew steadily upon this until the head escaped from the opening, but with so much difficulty that the incision was extended downward towards the pubis two inches, and through this opening the entire foal was extracted with comparative ease. The idea had already occurred to me that the case offered conditions favorable to ablation of the womb and ovaries, with the use of a drainage-tube through the neck of the womb into the vaginal canal. Having a set of rectal bougies of different calibre, made of hard-rubber, and hollowed so that one fitted inside of the other, the expedient was adopted of cutting off the closed end, this giving me a tube of from four to five inches in length, and with a bore of about three-

fourths of an inch, and at one extremity a shoulder or slight increase in the circumference to serve as a point of security for the loop of the ligature. This was passed through the rent in the womb, into the neck, and the groom-assistant was directed to pass his hand from below into the vagina, and grasp the protruding extremity with his fingers, so as to hold it steadily. A strong flaxen cord was then carried by a bent-eyed probe beneath the pedicle, and encircling the tube just below the slightly projecting shoulder, was firmly tied, and the excision of the organ was made above, about an inch and a half above this line, without the loss of any appreciable amount of blood from the tissues inclosed in the ligature. The ovaries were attached by the Fallopian tubes and a part of the lateral ligaments jointly with the womb, and all thus removed from the cavity of the abdomen. After thoroughly cleaning out the coagula, and sponging the surface with cloths wrung out of a five-per-cent carbolic solution, it was observed that scarcely any oozing of blood continued, and dry cloths being kept in contact with the incised surfaces for a short time, this entirely ceased. An oblong piece of sponge, with a piece of silk thread passed lengthwise through it, and sufficiently long to pass through the vaginal canal and out at the vulva, being in readiness, the extremity of this thread, with the extremities of the ligature, were carried by the eyed probe through the opening of the tube, and being seized below by the fingers of the assistant, were drawn down until the sponge projected from the lower end of the tube, and left in this position to obviate the entrance of air from below and to absorb the serous discharge. The incision in the abdominal wall, which had measured twelve inches under the influence of the distention, was reduced now to eight inches by the contraction of the abdominal muscles, and was closed by six points of silver wire suture. Over this a large compress of carbolized oil was placed, and a large bandage applied firmly around the abdomen, when the animal was untied and allowed to rise; the ends of the protruding ligature being secured loosely about the root of the tail, the case was left for observation, with direction to the assistant to pass a fresh piece of sponge daily into the opening of the tube after thoroughly washing out the vagina with injections of carbolized water. April 8th. The case was seen again, and on passing the right hand up to the tube, while the left secured the ends of the ligature, a gentle rotatory and upward movement of the tube indicated that the separation of the tissues was progressing around the circle of the ligation upon the tube; yet it was not deemed prudent to use much force, and no traction was made upon the cord further than to steady the tube under these manipulations.

April 10th.—Perceiving by the mobility of the tube that the line of separation was complete, it was determined to draw gently upon the lower end of the tube, while the ligature was released, so as to permit it, with the dead tissues above, to slip off over the upper end of the tube, and when it had been brought down about an inch, the ends of the ligature were seized and

drawn upon until the mass retained in the loop came away. The dead structure was only partially decomposed, and was not offensive to the smell beyond that of the ordinary secretions of these parts, so that I felt warranted in bringing the tube down until only its larger part, above the projection, rested in the lower part of the neck of the womb, by which it was held with firmness *in situ*. The lower opening of the tube was again plugged with carbolized sponge, and the vagina thoroughly washed with the injections of carbolized water, an obstacle being always presented by the sponge to its passing into the peritoneal cavity.

The wire suture was this day removed from the abdominal incision, which was completely united.

April 12th.—The tube was removed, and the orifice of the os uteri plugged lightly with the sponge, for security against entrance of the carbolized water into the cavity.

April 15th.—Upon attempting to pass the index finger within the cervical canal, it was arrested above by the evident closure of the upper orifice, and the discharge into the sponge, which had been placed within the lower extremity of the tube, was more of a sero-mucous character than of a purulent or sanious nature, so that there was no evidence of suppuration.

April 18th.—All indications for treatment having ceased, the case was left to nature from this time onward, and no untoward feature was presented from beginning to end.

The presence of amniotic fluid and blood conjointly with the foal in the peritoneal cavity for the space of four hours, and the subsequent exposure of the cavity to the contact of the air with the use of cutting instruments, cloths, and the hands for the various steps of the operations, gave no serious trouble. During the period of supervision in the case of the mare, it was observed that a she-goat was approaching delivery, and I requested that notice should be given me of the incipient indications.

On May 1st, I was advised by telegram that the event was approaching, but the young goats greeted my arrival, and the only alternative presented was to make an experiment in removing the womb and ovaries an hour after delivery. Having in hand an ivory tube with an opening of one-fourth of an inch, fashioned from the pipe of a syringe, and arranged with a shoulder to prevent its slipping through the ligature, the abdomen was opened, and the tube, fixed upon the end of a large sound, was introduced through the vaginal canal into the cervix, when the ligature was passed and tied securely around it, at a distance of a quarter of an inch from the upper end. The womb was now excised above the tube, and the ovaries and Fallopian tubes detached with the organ, so that, with a very slight loss of blood, which required little sponging, the ends of the ligature were carried through the

tube and out at the vulva. The opening in the median line, three inches long, was secured with the points of silver wire, and with a bandage around the body of the goat, the operation was complete. A sponge was passed into the vagina, which it was expected would serve to block up the lower opening of the tube, with directions to be changed daily. The sound was ordered to be introduced in the lower end of the tube, while injections of carbolized water were used in cleaning the sponges every day.

May 4th.—Upon returning to examine the case, the goat was found in a moribund condition, and died on the following day, without giving me an opportunity to make a post-mortem examination.

The puerperal state under which this operation was undertaken, did not afford favorable conditions for a successful result. I, therefore, determined to have another goat which was then pregnant taken to the city, and kept under my observation, so as to avail myself of the occasion to operate previous to the delivery.

May 22d.—The case was reported as presenting the preliminary signs of delivery, and I proceeded to exploration with my little finger in the vagina, thus being convinced of the partial dilatation of the neck of the womb. Everything was in readiness for the operation, and with the assistance of my alternate, Dr. Frederick Barlow, the hair was shaven from the median line of the inferior portion of the abdomen of the goat, and an incision of four inches made, commencing at a short distance from the pubic bone, and extending forward. The incision was made an inch longer in this than in the other case, from two considerations: first, that the kid or kids had to pass through it, and secondly, that there was a contraction to be expected from the distention which existed. Upon our examination through this opening, it was ascertained that but one kid existed in the womb, and, with a view to simplify the proceeding, it was thought best to enlarge the incision two inches, so that the womb with its contents might be brought away without delay after the excision, and thus not require the walls of the organ to be divided until it should be removed from the cavity of the abdomen.

The tube formerly used being passed as before, upon the point of the staff or sound into the neck of the womb, which was already more dilated than was desirable, the ligature was passed with an aneurism guide at right angles to the shaft, and then tightened and tied around the upper end of the tube, including the tissues of the cervix uteri. The excision of the womb was made with a strong pair of scissors, and the organ turned out of the abdomen without waiting to detach the other parts. The womb was immediately laid open by a free incision, and the kid being released, soon gave signs of activity, and was left to take its chances. The ovaries being now removed, with the parts

that still held the attachments of the womb, sponging with the old linen wrung out of a carbolized solution, and after this with others that were dry, there was scarcely a trace of blood to be found within the cavity, and the ligatures were passed down through the tube, so as to extend out of the vagina. The external opening in the walls of the abdomen was closed with four points of silver suture and a belly-band applied over a compress soaked in carbolized oil. A vaginal sponge wrung out of carbolized water being placed in the vagina, and packed up against the end of the tube, the work was finished. Not to prolong the incidental details, it so turned out that within eight days the case was satisfactorily terminated in complete recovery.

With these results five years ago, I felt assured that the human subject could be treated in the same mode, and have waited anxiously to have an opportunity of putting the matter into practice; without recording publicly these experiments, I hoped to be able to present an operation with like good results upon a parturient woman. But failing to secure such a case, the data are given to the medical profession for those of larger opportunities to test this combination of the ligature and drainage tube. It will be observed that my suggestions for the application of this process to the human female, are simply modifications of the method used in the lower animals, and while there is not perhaps a sufficient guarantee in these two favorable results, each operator still may determine upon the feasibility of the plan in any given case.

AUTOPLASTIC OPERATION FOR THE TREATMENT OF
ACQUIRED ATRESIA VAGINÆ.

BY

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Mrs. F. T., æt. 23, colored, typically healthy and robust, married five years, and has had one child. Since her accouchement, in 1878, menstruation has usually been painful. For a few months past, the paroxysms of pain and the history of obstructive dysmenorrhea have been more pronounced. The menstrual flow usually lasted a full week, but on several occasions, when menstruation was painless, the flow ceased on the fourth day.

Prolonged and painful menstruation was invariably followed by an extremely fetid leucorrhea.

A physical examination quickly revealed the fact that the finger could be introduced but $1\frac{1}{2}$ inches within the vagina, at which point the canal seemed entirely closed. By the use of a speculum, however, a small aperture was discovered which admitted the point of my smallest uterine probe, by the aid of which I concluded that the tissues forming the stricture involved only a certain proportion of the vaginal area, and that a vaginal vault of at least small capacity existed on the uterine side of the stricture.

Vaginal examination with the finger or speculum occasioned pain, which corroborated the patient's statement that sexual intercourse had been impossible, all attempts having been painful and unsatisfactory. She had not conceived since the birth of of her child.

Inquiry regarding the nature of her accouchement elicited the following history: Her pains began on Wednesday at dark, and a female eclectic physician was at once summoned. Soon after the doctor's arrival, the "waters broke," and the pains continued quick and strong.

The physician remained in attendance until Friday evening, when the doctor pronounced it a "dry birth," and asked the assistance of another physician, who upon his arrival promptly effected the delivery of a large dead child by means of the forceps. Although she had thus continued in hard labor for more than fifty consecutive hours, and notwithstanding the accomplishment of probably extensive injury to the parturient tract, she remained in bed but a few days. Upon going about, she experienced much vaginal tenderness, attended with a profuse discharge of yellow matter. These symptoms continued for several weeks, when she regained perfect health, excepting the dysmenorrhea referred to.

In view of the physical signs and the history furnished, there could be no doubt that the vaginal atresia was but the result of long and difficult parturition which had caused sloughing of the vagina and consequent union of its opposing surfaces.

With the hope of curing her, I operated as follows, assisted by Drs. Van Riper, Marsh, and Johnson. A narrow hysterotomy knife was thrust through the aperture, and the stricture divided by it each way laterally, until the supposed calibre vaginae was produced. This brought to view the os and cervix uteri, and a considerable area of the upper posterior vagina not involved in the cicatrix. The septum had a gradually increasing thickness from its centre or perforation in every direction toward its periphery or vaginal attachment. On the anterior vaginal wall the contraction was so considerable as to leave but a very narrow strip of cicatricial tissue between the cervix and the point of perforation, while behind the cervix, the cul-de-sac of Douglass and a small area of the posterior vaginal wall were normal to appearance and fully dilatable. The next step consisted in dissecting from the line of incision the upper and lower portions of both the anterior

and posterior vaginal walls for a short distance. The opposing flaps thus produced were deflected, coapted, and united by silk sutures, in a such way as to produce a large calibre. This was accomplished at the expense of shortening, in a degree, the vagina. After the sutures were inserted there remained only two or three small points of denuded vaginal surface. Sims' glass plug was then introduced into the vagina, and retained by a bandage. It served as a splint in holding the parts quiet, and being well borne by the patient, was allowed to remain in the vagina for two or three days. The sutures were removed at the end of a fortnight, when but two small spots of granulating tissue were discoverable. These healed in a short time, menstruation has since been painless, and the patient is now in possession of a vagina whose functions seem to be in no way impaired.

History of the surgical treatment of atresia vaginæ has furnished repeated examples of cases which operators have first regarded as successful, but which have afterwards proved otherwise, on account of cicatrization and re-contraction.

It is not only difficult but probably impossible to retain by operation sufficient vaginal calibre in all cases. It must, however, appear that the probability of failure is, in every instance, in direct proportion to the amount of exposed or denuded surface which the operator leaves to heal by slow process. If, by dissecting up flaps and re-applying them by torsion or deflection, we can lessen the amount of denuded surface, there can be no doubt that we shall in just so far insure our patient against the probabilities of re-contraction and ultimate failure.

AUGUST 4TH, 1882.

A CONTRIBUTION TO THE RESUMPTION OF MENSTRUATION AFTER PARTURITION.

BY

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ON May 30th, 1882, Mrs. G., 27, primipara, of highly nervous temperament, was delivered of a boy weighing about eight pounds. There was nothing worthy of note respecting the labor. Her "getting up" was remarkably good, especially in view of the fact that she had always been rather frail in body and delicate in health, and still further, that during the term of her pregnancy

she had been an almost constant sufferer from gastric and nervous derangements. Owing to these, and perhaps other causes, she had no secretion of milk, and did not nurse her child.

On the 25th of June, she imprudently exposed herself and took cold, which was attended with sore throat, cough, headache, and some rise in temperature.

June 28th, I received an urgent call to see her. Found her in bed, temperature 102° ; pulse, 120; respiration increased and variable, excruciating headache, with paroxysms of hypogastric and pelvic pains, which she likened in some respects to after-pains. There seemed to be close sympathy between the cephalic and the abdominal pains.

The lochial discharge, which had almost ceased, now reappeared with some color. It was not, however, notably offensive.

Examination revealed tenderness over both ovaries (ovaritis?), also congestion of the uterus and tenderness on pressure (metritis?).

Of course, the tenderness made out in any given case is not necessarily an exact index of the local condition, for the tolerance depends much upon the temperament and susceptibility of the patient.

The leading symptoms in this case answered in essential features to those of metritis.

Barker, in "The Puerperal Diseases," page 315, says: "If the discharge be chiefly bloody after the first week of the puerperal period, or if it become markedly more sanguinolent, or if, after it has once notably diminished, there be a reappearance of any considerable loss of blood, we may be almost sure of the existence of endometritis or metritis, particularly if this reappearance be attended with febrile exacerbations, and more or less pain in the region of the uterus."

Although the symptoms corresponded so closely in this case, and in the presence of what appeared to be a reasonable cause—taking cold—I did not feel fully assured in my diagnosis. I considered it prudent, however, to treat it as though of the utmost gravity. Ordered \mathcal{R} Tully's powder, Potass. bicarb., āā grs. x.; Hg. chloridi mitis, gr. iv. Locally turpentine stupes.

June 29th.—Temperature, 101° ; pulse, 105. Patient did not rest well last night. Distress not quite so severe, but still marked. Very nervous, almost hysterical. Tenderness about the same. Flow rather more abundant. Treatment continued.

June 30th.—Temperature below 100° . Leading symptoms subsiding. Patient comparatively comfortable. The cause of the explosion is now obvious—the return of menstruation.

Some years since, I had a case very similar to this. In that also, the woman did not nurse her child, and the evidences of

uterine or peri-uterine trouble appeared about the fourth week, and were so alarming that counsel was called, but the diagnosis remained at fault or in doubt until cleared by the unmistakable resumption of the menstrual function.

I have no idea that this complication is at all rare, but the books are singularly silent in regard to it. Fortunately, the treatment of the suspected graver form of disease is not likely to be far amiss should it prove to be but the return of menstruation.

The cases calling for this discrimination would seem to be those in which lactation does not occur, and the serious symptoms present themselves about the end of the fourth week.

CLINICAL CONTRIBUTIONS TO OBSTETRICS AND GYNECOLOGY.

BY

PAUL F. MUNDÉ.

IN the course of practice, cases frequently come under observation which present features of more than ordinary interest, both in a scientific and in a practical sense, but which are scarcely of sufficient importance or rarity to warrant their separate publication. Collected, however, and published in a series with epicritical remarks, such separate cases may together prove not only attractive reading, but also convey useful hints to the practitioner. These considerations have induced me to write out the following cases which have occurred in my practice during the past year.

I. Six cases of Inter-Partum Fever.

While for a number of years I had scarcely met with a case of puerperal peritonitis or septicemia in private practice (the only cases of the kind coming under my observation being in my service at the Maternity Hospital), during four months of the past twelve, six cases of febrile disturbance during and after parturition were seen by me, all in consultation, and five of them within one month, March, 1882.

It is a well-known, and so far as I am aware, unexplained fact, that certain forms of disease or certain accidents in medical practice are wont to "hunt in couples," or even in larger numbers. Thus, I have seen three cases of twins in two days, and two of the cases now to be related were of placenta previa and were both seen within ten days of each other, while in the previous eight years I had not seen an instance of this anomaly. The occurrence, however, of so many cases of puerperal pyrexia in the same month may be explained on better grounds than those of chance. The month of March of the present year was characterized by exceptionally disagreeable, changeable weather, during which, perhaps in consequence of which, an unusual virulence of inflammatory affections and a tendency of wounds to suppuration and septic complications were noticed. Thus, a number of cases of puerperal fever occurred in the city; a successive series of apparently favorable ovariectomies in the Woman's Hospital terminated fatally, and other minor operations were followed by cellulitis or the wounds healed badly, and all operations were for a time suspended at the hospital. An eminent gynecologist informed me that during March he was obliged in private practice to reopen entirely the wound of a secondary perineal operation, remove all stitches, and keep the surfaces clean by constant antiseptic irrigation, because on the fifth day after the operation the temperature ran up to 105° , and there was every evidence of septic infection. Only after several days' active treatment of this kind did the alarming symptoms subside; the operation was, of course, a total failure. I happened to perform quite a number of operations during March (one ovariectomy, three secondary operations for lacerated perineum, three operations for lacerated cervix, one cystocele, one excision of cyst from anterior wall of the vagina and removal of small fibrous polypus by torsion, one amputation of epitheliomatous cervix by galvano-cautery wire) and all made uninterrupted recoveries, with the exception of one perineum operation which was done in the last week in March, a few hours after I had removed the placenta with fingers and curette from the uterus of a lady who had miscarried in the second month and who presented the picture of probable severe septicemic poisoning (see case 5 of this series); in this perineum operation the temperature went up to 103 on the sixth day, and

consequently I removed the stitches on the eighth day, to find the wound completely healed and the perineum perfect. The next day this patient developed an unmistakable pleuropneumonia of one side, from which she recovered in due time without a drawback. As I have never witnessed this complication in over sixty secondary perineal operations, I am in doubt whether the pneumonia may not possibly have been of a septic character, although the good union of the wound and absence of suppuration incline me more to the belief that a draught of air through two windows, between which the patient lay, was the exciting cause of the pulmonary difficulty. My immunity from septic complications I attribute partly to chance and partly to the careful observance of thorough carbolization of hands, instruments, and sponges during the operations.

That there are certain seasons, certain months, when all wounds heal badly, when a so-called "genius endemicus" or "epidemicus" is floating through the air, and pervades private houses as well as hospitals, we all have had reason to observe from time to time; it is therefore not specially remarkable that the month of March of the present year, which is ordinarily one of the most inclement months of the year in our changeable climate, should have proved deleterious also to wounds, such as puerperal women and operated patients present.

CASE 1.—*Scarlatina in a Puerpera—Death.*

On November 30th, 1881, I was asked by Dr. H. O. Horton to see a patient of his, a lady whom he had delivered two days previously of a healthy child after a normal labor. On the previous day, that is twenty-four hours after delivery, the temperature and pulse suddenly went up, the patient became semi-delirious and drowsy, the lochia were somewhat offensive, and the condition seemed alarming. When I saw her, I found her comatose, roused with some difficulty, the tongue covered with a dark-red fur, with shining red edges, the face of a dusky hue, the abdomen normal, but slight tenderness, no tympanites. The temperature in the vagina was 105°, the pulse 160 and very weak. A digital examination of the uterine cavity (for possible retention of placental fragments or clots) revealed it perfectly empty and, so far as the touch could reveal, healthy; the uterus well contracted, fundus almost midway between symphysis and umbilicus; parametrium perfectly healthy; lochia decidedly putrid in odor. If there was a septic endometritis, as the general symptoms seemed to indicate, there certainly was no other evidence of it in the uterus itself but

the offensive discharge. What could have produced this septic infection in a healthy woman after an easy, normal labor in a private house? In a maternity hospital I should have looked for the source of infection in some other patient, or in the peculiar mysterious septic agencies often pervading hospitals, but in private practice one does not, as a rule, expect to meet such cases. While discussing the origin of the infection, and fully recognizing the extremely critical condition of the patient, Dr. Horton mentioned a peculiar reddish discoloration of the skin of the abdomen which he had noticed earlier in the day. A careful inspection showed a decided scarlet blush over the chest, part of the back and thighs and the hypochondriac regions, which blush closely resembled that of scarlatina. Here we had a solution for the rapid, dangerous illness of the puerpera, for the height of the fever, the coma and the collapse. It might be a case of septic endometritis induced by scarlatinous poisoning. It is true, there was no history of exposure, but there was scarlatina throughout the city. The condition of the patient prevented our learning whether she had had the disease before. I advised large doses of quinine to reduce the temperature; then salicylate of soda in gr. x. doses every two hours, cold ablutions or tepid packing, antiseptic intrauterine injections, and stimulants. But, whether the case was one of pure septic endometritis or complicated with scarlatina, the prognosis was eminently unfavorable. The treatment in either case would be the same.

I did not see the case again, but learned through a notice in the daily paper two days later that the patient died the day after I saw her. The confirmation of the diagnosis of scarlatina was brought me by another notice in the paper still two days later, announcing the death of the only other child of the lady, a girl of eight years, of scarlet fever, three days after the death of the mother. I subsequently learned that one of the servants was also taken ill with the same disease a few days after. The new-born infant escaped.

The occurrence of any exanthematous disease during pregnancy or parturition is justly assumed to be one of the most dangerous complications which can happen at that time. Even that ordinarily mild affection, measles, may in the puerperal woman produce alarming symptoms through its tendency to the hemorrhagic form and to pulmonary complications. Next to variola and typhoid fever, scarlatina certainly is the most serious eruptive disease by which the pregnant woman may be attacked. The mortality is given by McClintock at 10 out of 34 cases; by Braxton Hicks, 14 deaths out of 18; by Halahan, 6 out of 25. Only Hervieux and Brown saw no instance of death, and Denham but 1 in 8 cases. The average mortality is high; of 7 pregnant women, 3 died; of 134 women in whom

the eruption appeared during the lying-in, 64 died, being a mortality of 48 per cent. The period after delivery at which the disease appeared seems to make a difference in the mortality; thus:

Of 8 women who fell ill immediately after

delivery there died 6 = 75 %

Of 62 who fell ill on the 1st and 2d days, 35 = 56.5%

Of 27 who fell ill on the 3d day, . . . 14 = 51.8%

Of 22 who fell ill after the 3d day, . . . 3 = 13.6%

The day of death in 56 cases was 6 times on the 2d and 3d day after delivery; in 33 times from the 4th to the 7th; 6 times on the 8th and 9th; 9 times on the 10th to 15th day; and twice at a later period (Olshausen).

In the present case the patient presented the first sign of the disease on the second day, and met the fate which befell more than one-half of those taken ill on that day.

The view held by Helin and Kiwisch, and copied in blind faith by the majority of obstetric writers, that a scarlatinous rash occurring during parturition is merely a form of puerperal fever, to which they gave the name of "scarlatina puerperalis," is declared by Olshausen¹ to be unfounded and exploded. This author asserts that the occurrence of a rash, resembling that of scarlatina during true puerperal fever, has not been proved, and is a mere supposition of the first-named obstetricians. Neither clinical nor post-mortem observation confirms their opinion. All cases in which such a rash was noticed in puerperal women were nothing but instances of real scarlet fever, modified as regards some of the symptoms, and chiefly as regards the great mortality by the peculiar condition and susceptibility of the puerpera. These peculiarities of scarlatina *in puerperio* are the following: The time of incubation is unusually long, extending in some cases (Braxton Hicks, Montgomery) to two months and more. This accounts for the comparative immunity of women during pregnancy (only seven times out of one hundred and forty-one cases, between the third and seventh months). The date of attack was immediately after delivery in eight cases; on the first and second days in sixty-two, on the third in twenty-seven; after the third day, in

¹ Arch. für Gyn., vol. ix., 1876.

twenty-two. It is probable that the period of incubation is, on the other hand, unusually short in the *lying-in* woman.

The angina is considered by all observers to be exceedingly slight in scarlatina during parturition. This was the case in the present instance.

The appearance of the eruption is more sudden and more general than in the non-puerperal state, and in the severe cases the skin at once becomes livid in color. Sudamina are a frequent accompaniment. Diarrhea is also a frequent and unfavorable complication. Uterine hemorrhage is not mentioned as a result, and inflammatory affections of the peritoneum or sexual organs are uncommon and accidental complications. During pregnancy, out of seven cases, in four premature delivery took place.

The treatment differs in no way from that ordinarily employed.

The greater mortality from scarlatina during the puerperal state is not easily explained. We can merely refer to the same result in other exanthematous diseases, chiefly variola and typhoid fever, during parturition, and assume a greater susceptibility to all epidemic diseases at that time.

This greater susceptibility is conceded by a still more recent writer than Olshausen, viz., Legendre, in a graduation thesis published in Paris in 1881. He even says that "*lying-in*-females are more predisposed to scarlatina than to the other eruptive fevers; and in them it most frequently follows an abnormal type of development." This author also agrees with the commonly accepted opinion that "puerperal scarlatinoid and the so-called scarlatiniform eruptions are in all probability only attacks of unrecognized scarlatina, running an irregular course." He also warns against confounding eruptions similar to scarlatina occurring during septicemia with true scarlatinal eruptions. But he certainly is wrong when he asserts that "scarlatina in parturient females terminates favorably in the greater number of cases, and apparently adds nothing to the dangers of their situation." I need but refer to Olshausen's figures, taken from various sources, to disprove this statement.

According to Olshausen, then, whose review of the subject is one of the latest and most thorough, "a scarlatinous eruption during pregnancy or the puerperal condition indicates nothing but true scarlatina, so long as the accompanying symptoms and

the course of the disease are not analogous to puerperal septicemia or pyemia." While Braxton Hicks and Newman hold a different view, and contend that a puerpera taken ill with scarlatina is attacked with puerperal fever, and that if non-puerperal women become infected by her, they develop scarlatina; and while Leishman and Playfair state that puerperæ seized with scarlatina may in the later stages present symptoms indistinguishable from those of puerperal fever—the majority of obstetricians at the present day agree with Olshausen, that scarlatina in the pregnant and puerperal woman is no different disease from scarlatina in the child or non-puerperal individual, modified only and aggravated by conditions peculiar to parturition.

CASE 2.—*Retention of Placenta after Abortion; Septicemia; Death.*

On March 6th, 1882, I was called to see a multipara, who four days previously had been attended by a midwife in a miscarriage at four months, which, I was confidentially informed, had been induced by the patient. The placenta had not been removed, and I was called in on account of the high fever of the patient. I found her with an axillary temperature of 103.5°, a pulse of 130; a fetid vaginal discharge, and a yellow, sallow skin, presenting, in fact, unmistakable signs of septicemia. The cervical canal admitted the index finger, and I could easily detect the placenta adherent at the fundus. Without placing the patient under an anesthetic, I attempted to pry the placenta loose with my large dull curette, a manœuvre which had never failed me before. But in this instance I found an insurmountable obstacle in the uniform firm attachment of the placenta; at no point could I discover fissure or rent into which to insert the curette; the line of separation of placenta and surrounding endometrium was indicated merely by a sulcus and the increased thickness of the uterine wall. After repeated attempts, both in the dorsal position and through Sims' speculum, I laid aside the curette and proceeded to dig my way into the border of the placenta with the nail of my index finger. After about one hour of the hardest work of this character which I have ever undertaken, I succeeded in peeling off the afterbirth piecemeal and removing every portion of it. It appeared to be almost cartilaginous in its density and formed, as it were, a part of the uterine wall. (I was afterward informed that in the preceding labor at term the placenta was entirely adherent and had to be removed by a physician.) There was almost no hemorrhage during this operation. I then washed out the uterine cavity thoroughly with hot carbolized (five per cent) water, ordered twenty grains of quinine and stimulants ad lib.

On the next morning the temperature and pulse were normal, the patient looked bright and cheerful, and I had hopes of an undisturbed recovery. But on the following day the temperature

and pulse again went up to 103.5° F., and 130, and an intensely fetid discharge oozed from the vagina. There was no abdominal tenderness, however. An examination revealed an ante flexion of the uterus and consequent retention of the lochial discharge. Rectification of the flexion by finger internally and suprapubic pressure was followed by a gush of fetid, shreddy fluid. I again washed out the uterus with carbolized hot water, ordered thirty grains of quinine, and if the temperature still remained high at evening, two grains of salicylate of soda in peppermint water every two hours. As I was intending to perform an ovariectomy in a few days, I was obliged to turn the patient over to Dr. E. H. Grandin, who washed out the uterus every three hours, continued the salicylate, quinine and stimulants, and did everything in his power to save her. But in vain. On the second day after removal of the placenta, a hard, tense, and very tender swelling appeared on the right forearm extending slightly above the elbow; this I first attributed to rheumatism, but was finally compelled to admit that it was probably due to septic infection. Dr. Grandin informed me that it appeared also in the left forearm and persisted until death, on the seventh day after removal of the placenta. The temperature rose to 107° on the day before death.

This case illustrates the danger of allowing even an adherent placenta to remain in the uterus after an abortion. The blame to be attached to the midwife is not that she did not at once remove the placenta—this the difficulty I experienced in detaching it proves she could not have done—but that she did not immediately summon a physician to remove it. This instance but confirms me in the opinion which I have frequently expressed before, that *every* placenta after abortion should be removed AT ONCE, manually or with instruments (chiefly the large blunt curette) provided the patient is in a condition to bear and not be injured by the manipulation. My experience, extending over a series of years and a large number of cases, tells me that such an exception is but rarely met with, and that the *careful, gentle* detachment of the placenta by the finger or dull curette and its withdrawal by blunt, broad forceps, is attended by but little danger and seldom followed by inflammatory reaction. I have met with but one case of pelvic cellulitis after this operation, and that may fairly be attributed to direct infection from the already decomposed placenta. I immediately wash out the uterine cavity thoroughly with carbolized ice or hot water (whichever I think will be most grateful to the patient, for the effect is about the same), apply an ice-bag for twenty-four hours merely as a precaution, give ergot for a week or two (as I always do after an abortion), and all the patients whom I have thus

operated on and treated (nearly all consultation cases) have recovered without a bad symptom. The one case of pelvic cellulitis is the only exception, and she was well in a month. Certainly, I feel that I have done my duty much more fully to my patient and left her in far less danger by this treatment, than if I allow the placenta to remain and escape at its pleasure, or become the source of great peril, perhaps death, through secondary hemorrhage or decomposition and septicemia. The return of the septicemia and consequent fatal termination, in this case, were but the natural consequence of decomposition of the retained placenta. When I first saw and extracted the latter body, the septic infection was already too thorough to yield, even when its primary cause was removed. As regards the treatment, nothing is to be said except that the salicylate of sodium was used in addition to, and later instead of, the quinine, because I have found it to reduce temperature more permanently than the former in septic fever.

A brief report of this case was made by me to the New York Obstetrical Society and published in the supplement of this JOURNAL for September last. It was there read by a gentleman who sent me a postal card, the signature of which is illegible to me, saying that, in his experience, "in a great many cases the tr. veratri viridis, gtt. i., every two hours, would have relieved the septicemic condition. This remedy seems to be a powerful disinfectant in such cases; full pulse, bad smelling discharge, fever, etc., have been relieved by the verat. virid." I have no experience with the drug, but should be delighted to possess so powerful, and withal so simple and easy, a means of combating the symptoms and effects of septicemia, and hope my unknown correspondent will see this reference and favor me and the profession with a report of at least some of the cases in which he has "seen this remedy do wonders."

CASE 3.—*Placenta Previa Centralis; Double Placenta, Septicemia before Delivery; Version and Extraction of Dead Child; Continuance of Septicemia; Death.*

This case was seen in consultation with Dr. Charles Milne, and as it has already been reported in full in this JOURNAL for July, 1882, I will merely give its synopsis, in order to complete my series.

Multipara, seized with profuse hemorrhage at term on Monday evening, March 6th, 1882, which was arrested by tampons. Labor

not progressing, I was called on Friday 10th; found fetal heart absent, temperature, 102; pulse, 112; head presentation, cervix occupied by spongy body. Passed in hand at right of cervix, detached placenta, turned and extracted a dead, macerated child. The presenting placenta was immediately detached and extracted when it was observed that it had no cord, which latter still protruded from the vagina. On introducing my hand I found another placenta of equal (normal) size, attached to the left of the uterus to which the only cord was attached. The two lobes of the placenta were connected merely by a thin membranous band, which was completely torn through when the presenting placenta was expelled. This double placenta is of rare occurrence, only one precisely similar instance being on record. The patient rallied well from the operation, but in spite of intrauterine injections and all other remedies usual in such cases,*died on the seventh day after confinement of septic endometritis.

I think in a similar case of hemorrhage from placenta previa, I should advise and practise earlier termination of the labor, even by forcible dilatation of the cervix, and forceps or version, as the case might demand.

CASE 4.—Placenta Previa Centralis; Version; Extraction; Septic Hyperplastic Endometritis; Death.

March 19th, 1882, I was asked by Dr. Herschel, of Harlem, to see a patient with him whom he had delivered by version and extraction a week previously, the indication for the operation being central implantation of the placenta. Three days after delivery, the patient began to develop signs of endometritis, and when I saw her the pulse was 140, very feeble, temperature 104.5° in the vagina, skin pale and clammy, facies anxious. Examination showed an uncontracted uterus, into which my finger could easily be passed, and the internal surface of which was rough, corrugated, and apparently very much thickened. A putrid, cadaverous discharge of moderate amount was present. I made the diagnosis above stated, and predicted death within forty-eight hours, wherein I was subsequently informed I was correct.

It is curious that I should thus, within nine days, have seen two cases of central placenta previa, both terminating fatally from septic endometritis, when, for ten years previously, I had not met with a single case. These two cases make eight of placenta previa which I have seen, the first six being wholly under my own care and all ending favorably for mothers and children.

These two cases show that, even with the mothers safely delivered, and the danger from hemorrhage past, secondary fatal results may follow from endometritis and septicemia, for which diseases the operative interference and anemic state of the patients offer particularly favorable conditions.

CASE 5.—*Abortion; Retention of Placenta; Acute Early Septicemia of Peculiar Type Simulating Malaria; Metastatic Abscess of Wrist; Recovery.*

On Monday, March 27th, 1882, on returning to my office shortly after 11 A.M., I found that I had been twice called for to meet Dr. Horton in consultation. A coupé at this moment drove up containing the same gentleman, who desired me to accompany him to his wife at once. While on the way, he told me that, not finding me in, he had called for Dr. T. G. Thomas, who, being busy in his office, promised to come as soon as possible, but that he wished me to see his wife first, and do whatever Dr. Horton and I thought proper.

I learned that the lady, pregnant the second time at about two and a half months, had miscarried on the Saturday evening previous, the placenta still being retained. On the preceding evening, that is, twenty-four hours after the expulsion of the fetus, she had a chill, which was repeated next morning about an hour before I saw her. I found a slender, delicate-looking lady, in a state of stupor, to be roused only by loud speaking, and responding slowly and imperfectly to a request to show her tongue; vaginal temperature, 105.2°, pulse, 150, feeble; pupils contracted; speech halting, stuttering. In fact, all the symptoms of cerebral congestion. No vaginal discharge, offensive or otherwise. Digital examination showed the placenta firmly attached, with the exception of a small portion to be felt at the internal os.

The lady was evidently in a precarious condition, and it appeared to me, whatever might be the cause of the coma and fever, that the one indication was to remove the placenta as soon as possible. This was the only tangible point from which the symptoms could originate, although the short time since the miscarriage (forty hours), and the entire absence of decomposition of the secundines, scarcely seemed to indicate septic absorption as the cause of the difficulty. While considering this question, it occurred to me that possibly malarial infection might have something to do with it, and, on inquiry, I was informed that the lady had until recently lived in a district where malaria was not uncommon, but that she had never had a chill or any decided symptom of the disease. The husband stated that for some weeks she had complained of headache, aching in her limbs, and general *malaise*, which might possibly be attributed to malaria, possibly, however, to her pregnant condition. Not being able to decide this matter, and wishing, above all things, to reduce the temperature and rouse the patient from her stupor, I ordered thirty grains of quinine by the mouth (which would do equally well for septicemia or malaria), cold compresses to the forehead, and heat to the feet and legs, and returned to my office for my instruments for removing the placenta. Finding patients there awaiting me, I was detained, and was soon sent for to meet Dr. Thomas, who had just arrived. On my entering, he told me that he had examined the patient, and thought it to be a clear case of septicemia, and that the one thing to do

was to remove the placenta and membranes immediately. To this I, of course, gave a ready assent, as I had the curettes and forceps for the purpose in my pocket. But I ventured to question the diagnosis of septicemia, on the ground of its being too soon after the abortion, and the entire absence of decomposition of the retained placenta. Dr. Thomas reminded me of the cases of rapid septicemia following ovariectomy (within twenty-four hours), and said that the absence of an offensive odor did not absolutely disprove the possible presence of decomposition sufficient to give rise to septic absorption. He further remarked that the present month was a very unfavorable one for the healing of wounds, that he had been compelled to cease operating at the Woman's Hospital on account of the septic tendency there present, which seemed to extend also through the city, and related an illustrative case to me, which I have already mentioned in the earlier part of this paper. Finding no evidence in support of the malaria theory, and having already been prepared to act on his advice to remove the placenta at once, I was quite ready to agree with Dr. Thomas that the case was one of acute septicemia. I accordingly proceeded to remove the secundines, which I did with some difficulty by the fingers and blunt curette, the patient struggling violently in her semi-conscious state, which prevented my using chloroform. The uterus was well washed out with carbolyzed hot water, an ice-bladder was placed on the abdomen, and the patient was wrapped from axillæ to knees in a sheet wet in cold water, to reduce the temperature. In accordance with Dr. Thomas' suggestion, twenty grains of quinine were given, in addition to the thirty I had already ordered. Stimulants were freely administered, and in the course of the evening, the patient rallied somewhat, and recovered consciousness. The temperature fell to 102.5°. The intra-uterine injections were repeated every three hours, with the result of always reducing the temperature temporarily, and were discontinued after a couple of days, as the uterine discharge was at no time offensive, and they seemed to exert no permanent effect on the temperature. The irritable condition of the patient's stomach was finally relieved by pure lime-water. The fever not yielding to repeated large doses of quinine, the salicylate of sodium was substituted in ten-grain doses every two hours (given in capsules with honey at Dr. Horton's suggestion) until eighty grains were taken within eighteen hours. The salicylate in capsules seemed to be borne well by the stomach, but gradually produced its characteristic cerebral symptoms of muttering delirium and restlessness, when it was discontinued. On the second day, a tense, tender swelling of the right wrist and hand appeared, which seemed to me to confirm Dr. Thomas' diagnosis of septicemia, and which I could not but consider conclusive evidence of septic absorption. In spite of the salicylate (which certainly succeeded in keeping the temperature down to 102°, and occasionally below that point), cold affusions and packing, stimulants, and as much nourishing fluid food as the patient could bear, her condition was still so critical that Dr. Horton and

I thought best, on the evening of the fourth day, to have additional counsel, and Dr. Fordyce Barker was requested to see the case. He pronounced it to be one of malaria, complicated by articular rheumatism, and could detect no evidence of septicemia. His prognosis was decidedly favorable. He stated that he had seen this complication of rheumatism and malaria, and saw no reason why both should not occur during the puerperal state. He attributed the delirium and insomnia entirely to the salicylate, and advised its temporary discontinuance, and the administration of bromide of potassium sufficient to produce sleep, and a renewal of the salicylate next day if the fever continued. This was done, about sixty more grains of salicylate were given, the temperature now fell to 101°, the delirium disappeared, the patient grew brighter, and gradually began to improve, so that by the tenth day from the alarming attack in which I first saw her, she was out of all danger. The swelling in the wrist began to fluctuate about the seventh day, and on being opened discharged several ounces of good pus; it was found necessary to repeat the incision at a later day. The patient ultimately made a perfect recovery.

The peculiar features of this case are: 1. The rapid occurrence of a chill (within twenty-four hours) after the escape of the fetus, and the complete prostration of the patient by the poison (septic or malarial). 2. The difference of opinion by two equally celebrated authorities as to the character of that poison.

In support of Dr. Thomas' opinion may be adduced the cases of sudden death within twenty-four or forty-eight hours from undoubted septicemia of patients after ovariectomy, which have occurred in his own practice, in that of Sims, and doubtless of many other operators whose records I have not at hand. According to Sims, the presence of even a drachm of clear, reddish, not necessarily decomposed, serum in Douglas' pouch, was sufficient to prove that death had occurred from septic absorption. The French have termed this form of sudden septic infection "*septicémie foudroyante*," lightning-like septicemia, as an indication of the suddenness with which it attacks and kills its victims. In further aid of the theory of septic absorption, the acute inflammatory swelling of the right wrist should be especially noted. Its occurrence reminded me of the case already reported in this paper (Case 2), where the same symptom showed itself, and where the patient unquestionably was suffering and died from septicemia. The suppuration which ensued in the present case adds to the septic theory.

Dr. Barker's view of malaria complicated by acute articular rheumatism rests partly on the previous residence of the patient

in a district where malaria was more or less prevalent ; on his failure to discover an evidence of septic infection in the occurrence of a chill so soon after the miscarriage, without the least sign of decomposition in the retained secundines, and, finally, on his having seen cases in which conditions very similar to those in the present instance manifested themselves in the puerperal state.

In his paper on "Puerperal Malarial Fever," published in this JOURNAL in April, 1880, he relates a case (p. 272) in which the patient was seized with a chill in less than twenty-four hours after her confinement. A "distinguished obstetrician was called, who pronounced the case one of well-marked septicaemia, the temperature at this time being 105° , and recommended cold water affusions on a special bed for the purpose." But the temperature fell without this treatment ; the patient began to perspire, and rapidly recovered under large doses of quinine. In another case (p. 276), the patient was seized with a chill and active delirium on the eleventh day after confinement ; on the next day, "she was in a state almost of semi-coma. She could be roused to some consciousness, but was taciturn and sullen." This patient also recovered under quinine treatment.

Of these two cases, each presents features similar to those in our case ; the first, the accession of the chill within twenty-four hours after parturition, and the diagnosis of septicaemia by another physician ; the second, the semi-coma and sullen taciturnity, which was strongly marked in our patient for several days.

Emanuel Goth, of Klausenburg, Germany, in an article on "The Influence of Malarial Infection on Pregnancy, Labor, and the Puerperal State" (*Zeit. f. Geb. u. Gyn.*, VI., 1), states that "very frequently women fall ill (of malaria) in the puerperal condition, who were well during pregnancy, and the malaria is often of a severe type. Puerperæ possess a great disposition to malaria, even those who formerly successfully resisted the disease. It even happens that women who never suffer from malaria are affected by it only during their lying-in period."

Now, in our case, the rises of pulse and temperature were not intermittent (except the temporary remission on the first day after removal of the placenta and intrauterine irrigation, etc.), but continued with but slight variations until both gradually declined. In the cases of true puerperal malaria, where the disease manifests itself by such an explosion of striking

and alarming symptoms, there is a remarkable remission on the following day" (Barker, l. c., p. 274); but this same authority goes on to say that this succession of phenomena of rise and fall is seen only in typical cases; usually the remission is less marked.

Considering the evidence above adduced in support of both the septicemic and malarial view held by each of the distinguished consultants respectively, was it strange that the attending physicians should be in doubt as to the real nature of the case? The patient fortunately verified Dr. Barker's prognosis; but it must be emphasized that the height of the fever was already on the wane when he first saw her. Possibly the system may have begun to recover from the first furious onslaught of the septic infection?

I confess that for a time I was in doubt as to who was right. The suppuration of the swelling in the wrist, its resemblance to the appearance in my previous case of septicemia, and the great rarity of suppuration in joints swollen with acute rheumatism—these reasons have finally led me to incline to the septicemic view of this case. But when authorities of such eminence as the two gentlemen referred to hold such diametrically opposite opinions as to the nature and origin of certain symptoms, the difficulty of correctly diagnosing between some cases of puerperal septicemia and puerperal malaria must be self-evident.

CASE 6.—*True Malarial Puerperal Fever—Recovery.*

On March 31st, while I was still in consultation on the case just related, I was asked by Dr. L. A. Rodenstein to see with him a lady whom he had delivered with forceps about thirty-six hours previously, and who, on the preceding evening, had been seized with a chill and high fever. He had given her ten grains of quinine, but without benefit, since the fever was unabated on the next morning. I saw her about forty hours after confinement, and found a large, fleshy, robust woman, with perfectly clear consciousness and cheerful expression, but with a vag. temperature of 105.2° and a pulse of 120 to 130. There was no odor to the lochia; no abdominal tenderness, and, indeed, no sign of local or general inflammation.

The lady had lived in a malarial neighborhood, had had attacks of malaria at different times, and was now living in a suburb of the city where that disease was not unknown. Considering these facts and the utter absence of a local cause for the fever, I pronounced the case puerperal malaria, and advised twenty grains of quinine, to be followed by salicylate of sodium in ten-grain doses every two hours, until the cerebral effect appeared, if the quinine failed. The correctness of the diagnosis was proved by

the complete subsidence of the fever during the night, and the patient recovered without a drawback.

The malarial cause of the pyrexia in this case may, of course, be questioned, since a similar febrile disturbance might be due to mental excitement, indigestion, constipation, or the inception of lactation. But the chill occurred too early for the latter function, and none of the other factors had existed.

I have met with one more case of acute puerperal septicemia, with temperature 105° and pulse 130 and more, and intensely offensive uterine discharge, in which large doses of quinine and salicylate of sodium, and intrauterine injections of carbolyzed water were followed by complete recovery. It was a patient who was admitted to Mt. Sinai Hospital about a week after confinement, and who was isolated and treated in the manner indicated.

II.—*Reflex Syncope Produced by Pressure on the Cicatricial Plug of a Lacerated Cervix. Cure by Trachelorrhaphy.*

Mrs. H. B., twenty-two years of age, married six years, mother of one child, five years of age, presented herself at my office during the autumn of 1881, with the following history:—Since the birth of her child she had experienced frequent pain in the lumbar and both inguinal regions, and menstruation had appeared every three weeks. Her chief complaint was, however, stated by her husband, who informed me that during the past two or three years she had gradually lost all sexual desire and invariably “went to sleep” during coition, and was only awakened with considerable difficulty after the completion of the act, of which she appeared totally unconscious. This peculiarity naturally surprised and annoyed the husband; the wife seemed indifferent to the matter. It was this symptom chiefly which led the husband to bring his wife for examination and treatment. The patient, a short, fleshy woman, was placed on my examining table, and digital exploration at once revealed a deep bilateral laceration of the cervix up to the vaginal vault. While touching the angles of the rent, I asked the patient whether she experienced pain; receiving no reply, I glanced at her face, and found the eyes closed, and the woman apparently sound asleep. Breathing was regular, color natural. Not succeeding in rousing her by loudly calling her name, shaking her, or forcibly pressing her cervix, I thrust the fingers of one hand into the left abdomino-ovarian region as deeply as possible. A groan was the result, and, on pressing the right ovarian region with the other hand, the patient suddenly sat bolt upright, rubbed her eyes, and looked about her with a bewildered air, as if awaking from a long sleep. She seemed utterly unconscious of what had occurred. After a few minutes, I placed her on

her left side, and examined her with Sims' speculum, approximating the everted lips and touching the angles with the sound. The same phenomenon of sleep recurred, and was interrupted in the same manner. The edges of the rent were entirely cicatrized and smooth, and touching them gave no pain.

I could not but attribute this peculiar symptom to some hidden reflex influence emanating from the exposed nerve filaments of the cervix, as it appeared only when that part was irritated during coition and examination. The indication for a restoration of the cervix to its integrity appeared given, and, after some preparatory treatment for a moderate cervical catarrh, I closed the double rent in the usual manner. Complete union took place, and I lost sight of the patient for about six months, when she and her husband returned to inform me that her sexual appetite had returned; that the trance during coition had disappeared, there being no sign of it at the first connection after the operation, and that she felt entirely well.

I have read of cases in which aphonia, epileptiform convulsions (Sutton), sciatica, hemicrania (indeed, I have met with an instance of the two latter neuralgiæ, which I shall next relate) have been apparently produced by reflex irritation proceeding from a cicatrized cervical laceration; but a reflex neurosis affecting the brain in the way related in this case had not come under my notice. Diminution of the sexual appetite as a symptom of cervical laceration is not mentioned by the text-books or the numerous authors who have written on this subject of late years; many of them speak of dyspareunia or painful coition as a symptom, also of occasional sterility as a result, and of hemorrhage during coition, but none, so far as I am aware, speak of sexual impotence in this lesion, except a most recent writer, Dr. Edward J. Ill, of Newark, New Jersey, through whose courtesy I have just (Sept. 14th) received a reprint of a paper on "Forty-four Cases of Laceration of the Cervix Uteri," read by him before the New Jersey Medical Society at its annual meeting in 1882. The doctor says that his attention having been called to this symptom by one patient, he sought out his former cases of operation, and found that in 34 cases there was no sexual desire or orgasm during intercourse before the operation; 3 were widows, from 5 he could get no answer, and in 1 case (nymphomania) there was increase. Of the 34 cases, 27 were entirely cured and regained their sexual appetite (by the operation is naturally to be inferred); in the remaining 7 the sexual desire did not return.

There is thus a new indication added to the numerous ones already accepted for the performance of hysterotrachelorrhaphy, namely, the restoration of the natural sexual appetite, and thereby the possible cure of acquired sterility.

III. *Hemicrania and Sciatica depending on Laceration of the Cervix and Chronic Pelvic Cellulitis. Cure by Local Galvanization.*

In October, 1881, I was consulted by Mrs. S., 39 years, married twice, one child by first husband eighteen years ago; married seven years to second husband, without becoming pregnant. Menstruation every four weeks, rather scanty, lasting ten to twelve days, and always, since eighteen years, accompanied by pain in sacrum, right groin, and down right thigh, together with right hemicrania (migraine), and nausea and vomiting. This last symptom gave her the most annoyance, as it began several days previous to and lasted nearly through the whole menstrual flow, and besides, was liable to come on after any excitement, mental or physical, pleasurable or the reverse. She was, in fact, rendered an invalid by this infirmity, although otherwise a stout, robust, healthy woman. Her spirits began to droop most decidedly under this infliction; she became morose, melancholy, irascible. Thinking, from the constant recurrence of the hemicrania with the menstrual flow, that there might be some disease of the sexual organs, she had for five years been under the care of a now deceased well-known gynecologist of the old school, who treated her with caustics, etc., without, as she said, the slightest benefit.

An examination showed a large bilateral laceration of the cervix of the third degree, with surfaces and angles dense and cicatricial, uterus slightly less movable than normal, and above the right vaginal vault, directly connected with the upper angle of the rent, a flat, hard, immovable disc, pressure on which caused the pain already mentioned in the right groin and down the right sciatic nerve. This mass was evidently the remains of a plastic exudation, which had doubtless existed many years, probably since the occurrence of the rent eighteen years before. The uterus and ovaries were otherwise normal. While the connection between the inguinal and crural pain seemed clear enough, and I thought I could benefit her for this trouble, the relation between the local condition and the hemicrania did not appear so clear, neither was the result of treatment particularly encouraging. I told the lady and her husband my diagnosis and prognosis, and offered to try local treatment for a while, although I could not offer any great hope of a complete cure. They accepted this chance, and I made an application of tr. iodine to the cervix and vaginal vault, and inserted a glycerin tampon, directing her also to use hot vaginal injections *lege artis*. A few days later, I repeated this treatment, when I was called the same evening on account

of severe pain in the right groin and leg and hemicrania. I was obliged to remove the tampons, and give a hypodermic of morphine.

When the patient recovered from this shock, and again called at my office, I felt disinclined to repeat this treatment, and was almost in a quandary what to do, when a case occurred to me in which I had permanently relieved acute sciatic neuralgia, proceeding from pelvic cellulitis, by the vagino-cruro-abdominal application of the galvanic current. I determined to make the experiment, and introduced the round metal button electrode attached to the negative pole into the vagina, holding it against the induration in the right pelvic fossa, and placed the positive sponge electrode over the right ovarian and post-trochanteric regions alternately. I passed the current of a Galvano-faradic Co.'s sixteen-cell battery through the tissues for fifteen to twenty minutes, gradually increasing the cells from four to ten, and occasionally reversing the current. When the patient left the table, she expressed herself as feeling easier in her side and hip than she had for weeks, and said that the pain with which she had entered had entirely left her. Encouraged by this result, the galvanic sittings were continued every other day, and were gradually increased to one-half and three-quarter hour, and to sixteen cells; in the week preceding the expected menstruation, during one-half of the sitting, I inserted a sound-electrode, connected with the negative pole, into the uterus, hoping thereby to increase the flow. To our mutual pleasure, the next period came on with scarcely any pain in groin or side, and with migraine only on the first day. The patient was overjoyed, and insisted on continuing the galvanic sittings every day, in order to insure the benefit already secured. The next menstrual period passed without either local pain or migraine, and the patient's spirits rose proportionately. I now gradually began to diminish the frequency of the sittings first to every other day, and then to two per week. Under this treatment, two more entirely painless menstrual periods passed, and the hemicrania had not appeared for nearly four months. The lady even went to a large ball where she stayed until three o'clock in the morning, and no migraine followed this dissipation, which formerly would have been dearly bought by several days' illness.

To all intents and purposes, the patient was now cured. The plastic exudation had disappeared, hastened, no doubt, by the hot vaginal douches, which were continued during all this treatment. But the real and primary cause of all the reflex neuralgic symptoms, the old cicatrized laceration of the cervix, still remained. For a month I debated whether I should "leave well enough alone," or risk rekindling the old cellulitis by operating on the cervix. The patient was extremely anxious to be permanently cured, and was willing to take the above risk. I, therefore, finally decided to perform the operation, and did so on March 15th, 1882, cutting deeply so as to remove all cicatricial tissue, and inserting eight wire sutures. Removing them on the tenth day, I found perfect union, and the natural shape of the cervix restored.

Subsequent examination has shown me that this favorable result has been maintained. The patient has remained well, without either ovarian or sciatic neuralgia or hemicrania to the present day.

While I have frequently used the galvanic current locally to reduce a hyperplastic uterus, to bring on the menstrual flow, and occasionally with benefit to relieve backache and diffuse pelvic pain from chronic pelvic cellulitis, with or without a prolapsed ovary, I had never employed it as an application to the uterus in reflex hemicrania. I should probably have not thought of using it for the sciatica, had not a case occurred in my practice during the preceding winter, in which a large acute cellullitic exudation in the right pelvic fossa, by pressure on the sacral plexus, produced such severe sciatica as to require two hypodermies of morphine a day; local (vaginal and post-trochanteric) galvanization cured it permanently in less than a week. But the beneficial effect of the electricity on the hemicrania in this case was at the outset a surprise to me, and purely accidental. I shall certainly repeat the trial in the next suitable case of migraine.

IV. *Chronic Hemicrania associated with Unsuspected Retroversio Uteri; Replacement. Pessary. Complete Relief.*

Miss S., 40 years, of stout, healthy appearance, consulted me in December, 1881, at the suggestion of Dr. Louis Elsberg, under whose care she had been for some time for a right hemicrania, which had for years accompanied every menstrual period, but also manifested itself repeatedly during the month, and really never left her entirely comfortable. The doctor had endeavored to benefit her on the supposition that the neuralgia might be associated with catarrh of the frontal sinuses, but failing, had hazarded the supposition that her uterus might be at fault, and sent her to me. The lady had no symptom whatever indicative of sexual disease, neither backache, ovarian, nor suprapubic pain, nor leucorrhea. But she readily assented to an examination, and to my surprise, I found a retroversion of the uterus of the second degree, the organ being somewhat enlarged. It was readily replaced by two fingers in the vagina, with the patient in the semi-prone position, an Albert Smith pessary fitted with ease, and the lady told to come again in a few days and report. This she did, and the pessary was found to support the uterus admirably in its normal position. After the next menstrual period, the lady again presented herself, and stated that she had had some migraine, but much less than formerly, and since that date, now over nine months, she has had but one attack of "sick headache" of moderate degree, which

was clearly due to constipation and so-called "biliousness," and was relieved by pil. hydrarg. and a saline laxative. She is still wearing the pessary, and expressed herself at the last report as overjoyed at being rid of the frequent attacks of illness which, as in the preceeding case, made life a burden.

While not exactly pertinent to the point of this case, it may not be without some interest to state that this lady, who positively denied ever having been married, had absolutely no hymen, not even a caruncula myrtiliformis, and that the vaginal entrance was smooth, capacious, and freely dilatable even to the admission of half the hand, precisely as in a multipara. The perineum was not torn, but there was no distinct fourchette, and the vagina was extremely roomy. The external os was slightly open, but no evidence of a laceration, be it ever so slight. Neither were there any striæ albicantes visible on the abdominal integument. Was this an instance of congenital absence of the hymen, or was its entire disappearance due to the usual causes? I confess I still have my doubts as to the congenital absence theory.

This case illustrates the utility of recollecting that in a woman any symptom, no matter how remote from her pelvic organs or how apparently healthy the latter may be, may possibly depend upon some entirely unsuspected disease of the sexual system, which only local examination can reveal.

V. Epithelioma of Cervix, Amputation by Galvano-Cautery Wire during Unsuspected Pregnancy; no Interruption of the Pregnancy, and no Return of the Disease Four Months after Operation.

Mrs. B. D., forty-one years, multipara (ten children, four miscarriages), had been bleeding for seven months, at times quite profusely. A physician had examined her and diagnosed a uterine polypus. On admission to my service in Mt. Sinai Hospital in April, 1882, I made a vaginal examination and found a soft tumor, evidently an epithelioma, of the size and shape of a lemon, attached to the posterior lip of the cervix, the anterior lip and the vagina not being involved. A quite profuse hemorrhage induced me to desist from a more thorough examination of the other pelvic organs. On April 21st, I removed the tumor by the galvano-cautery wire, using seven minutes to cut through the soft pedicle of about one inch in diameter, on a level with the vaginal vault. (In another case of hypertrophic elongation of the cervix of a prolapsed uterus, which I amputated by the same wire, on the same day, immediately before this case, I spent twenty-two

minutes in drawing the wire at dull-red heat through the dense, tough cervix.) In the present case, in spite of the slow operation and moderate heat, a small artery spurted and required the platina button to arrest the hemorrhage. The patient made a good recovery from the operation, and when she was discharged after two weeks, there was no return of the disease.

At the operation, the purple color of the vagina, cervix, and tumor was noticed, but attributed to the vascularity peculiar to the epithelioma. On the return of the patient for inspection two months later, while placing her on her left side for examination with the Sims speculum, the intensely purple color of the vulva was noticed, and at once the recollection of the same appearance of the cervix at the operation recurred to me, and the idea flashed upon me that she was pregnant. On asking her, she said that she thought she was, because she had felt something like "life" three weeks ago. On making a digital examination, the stump of the posterior lip of the cervix was found perfectly healthy and smooth (as also confirmed through the speculum), and through the anterior vaginal wall an indistinct ballottement was discernible. External palpation showed the fundus uteri at the umbilicus; the fetal heart was as yet inaudible, and the child's limbs could be but indistinctly felt. But there was no doubt of her being in about the beginning of the sixth month, and therefore she must have been about four months pregnant at the time of the operation. Had bimanual examination been practised at the first and only digital exploration made by me, the enlargement of the uterus would have been easily recognized and probably correctly explained. The woman herself had no idea of being pregnant at the operation, as she had been flowing more or less for months.

August 16th, I saw her again, when she was at the end of her eighth month, and found the cervix still healthy, and the pregnancy progressing normally.

The time is too short since the operation to allow more than a hope that the disease may not return; but in all the cases in which I have amputated the cervix for epithelioma by the cautery wire, the disease has again sprouted out within four to six weeks. It is true, in none was the growth so localized and pediculated as in this instance.

VI. *Elephantiasis Vulvæ; Pregnancy; Amputation of Tumor. Progress of Pregnancy.*

Mrs. M. C., colored, aged twenty-four years, always well until six years ago, when, during her first pregnancy, she noticed an enlargement of the labia, which was not painful. After the birth of the child, this swelling gradually diminished and finally disappeared. At her second pregnancy, four years later, the enlargement again showed itself, and rapidly attained its present size. She consulted a physician who suspected pus, and made an inci-

sion without finding any. This incision in the right labium has never healed, and is now an ulcer which is very painful, bleeds readily, and discharges an exceedingly offensive secretion. This discharge and the frequent pain, chiefly at night, induced the patient to apply for relief to Dr. Alfred S. Dana, who brought her to me, and she was by me admitted into my service at Mt. Sinai Hospital.

I found the labia majora, clitoris, and upper portion of both nymphæ degenerated into a large, hard, fleshy mass, with a wrinkled corrugated surface, overlapping the vaginal orifice. There was no trace of the clitoris, as such, discernible. Between the two lateral lobes of the growth at their upper angle was a deep, raw fissure, and on the right lobe an excavated ulcer of the size of a half-dollar, both of which secreted an exceedingly offensive discharge. Fig. 1 gives a very good idea of the tumors. The woman said she was about four months pregnant, which was found to be correct. In addition to the discomfort experienced by the woman, the husband had a selfish reason of his own why he wished something to be done for the growth, not, as is generally the case, because it interfered with his marital privileges, but because, since the existence of the disease, the sexual appetite of his wife had increased so much as to render it difficult for him to satisfy her.

In view of the sufferings of the patient and her urgent desire to be relieved; further the certainty of the tumors growing with advancing pregnancy, and possibly causing obstruction to delivery, I decided to employ the only practicable treatment, operative removal, at once, in spite of the existing pregnancy. Of the methods of removal, that by the galvano-cautery wire (encircling the whole mass by the loop) was probably the safest as regards hemorrhage, but it formed a large eschar with subsequent granulating surface, slow healing, and a large scar. I recollected seeing in a recent number of the *Zeitschrift für Geburtshülfe und Frauenkrankheiten* a report with diagrams of two similar cases, operated on by Carl Schroeder, in which he removed the tumors with the knife from below upwards, inserting and tying the sutures as he proceeded, and in this way closing the wound completely without the use of ligatures, which would have interfered with union by first intention. Arteries were secured by specially deep sutures. But this method seemed to me laborious, and Schroeder stated that in the two cases in which he employed it some sloughing of the integument took place and perfect primary union was not obtained. I therefore decided to employ means to arrest the hemorrhage temporarily, and to remove the tumor as rapidly as possible, ligating such arteries as were sure to bleed, in the usual manner. With the assistance of Drs. John A. Wyeth, Dana, and the house staff, I proceeded to operate, passing three long pins underneath the tumor, as seen in Fig. 1, and tying a stout elastic ligature tightly around its base under the needles. In this manner the base was pediculated, and all chance of hemorrhage removed. The tumor was then removed with the knife immedi-

ately above the pins, without the slightest bleeding. On withdrawing the pins, the elastic ligature, of course, slipped off, allowing a wound of nearly the size of the flat hand to open, from which a dozen arteries spurted; one, probably the arteria clitoridis, as large as a small goose quill. Dr. Wyeth rapidly seized the mass in his hand, and by gathering up the loose integument thoroughly compressed the base of the wound and arrested the bleeding, while I picked up and ligated artery after artery. The upper ligatures (one thread to each) were carried out of the upper angle of the wound, the lower threads out at the lower angles on each side, as shown in Fig. 2. The wound was then closed by deep silk sutures, grasping the base of the wound as well as the skin.

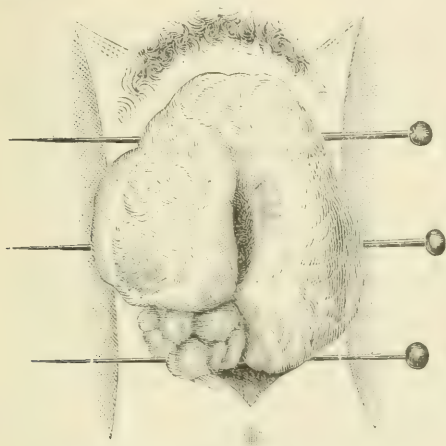


FIG. 1.

FIG. 1.—The elastic ligature was tied around the tumor beneath the pins.

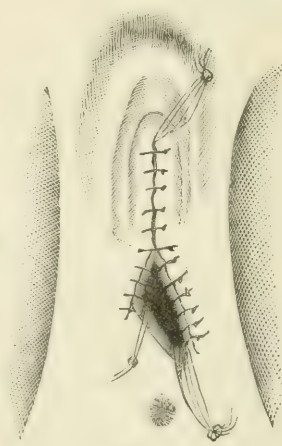


FIG. 2.

FIG. 2.—After operation.

The after-treatment consisted merely in moderate compression by a pad and T-bandage to secure constant apposition of the flaps and deep union. Very trifling suppuration occurred in the tracks of the ligatures, which came away between the tenth and twelfth days, when the wound seemed entirely closed. The patient left the hospital of her own accord on the fourteenth day, having entirely recovered and no interruption of the pregnancy having occurred.

The danger in removing these large vascular tumors of the external genitals lies mainly in the hemorrhage. If we can avert this, and at the same time at once unite the edges of the wound and secure union by first intention, the operation loses much of its formidable character. The time of healing is greatly shortened and the mutilation comparatively slight. These objects are attained by the method employed in the present case, which seems far superior to the tedious and com-

plicated removal by the galvano-cautery wire or *écraseur* with its protracted convalescence and large cicatrix. So far as I could ascertain by searching the literature, the elastic ligature has not been employed as a temporary hemostatic in this class of cases. Dr. Emmet, when I showed the specimen at the New York Obstetrical Society, said that he had removed similar growths by the knife and ligated the arteries immediately afterward, but so far as I understood him he had used neither the pins nor the elastic ligature.

Possibly the sutures might have been introduced and tied before removing the pins and the elastic ligature, and if passed deeply, the wound have thus been closed without the least hemorrhage; but I should fear to miss compressing one of the arteries in this necessarily haphazard ligation, and that secondary hemorrhage might occur. If the assistant grasps the base of the wound before the surgeon removes the pins and ligature, all hemorrhage is absolutely avoided, and the arteries can be ligated separately at leisure, as I did in this case.

The advisability of performing any operation during pregnancy, either on or near the sexual organs, or on remote parts, will depend on the necessity for speedy interference and the danger of waiting until the completion of pregnancy. No doubt, as a rule, operations which can be deferred should never be done during pregnancy. But in certain cases delay is more dangerous than the risk of inducing premature delivery. Thus an ovarian tumor, a fibroid polypus protruding from the cervix, a tumor of the vagina or labia may grow so large as to interfere with or entirely obstruct delivery; or a carcinomatous degeneration of the cervix may spread so rapidly as to prevent dilatation or entail rupture of the cervix; or a surgical disease of a distant part may endanger the life of the woman before the normal end of her pregnancy. Recent observations, collected chiefly by Verneuil, show that operations and accidents during pregnancy are by no means so generally followed by abortion and premature delivery as was formerly supposed. All the conditions referred to above have been operated on, and the women have gone to term. Of Lawson Tait's last one hundred cases of ovariectomy, reported at the meeting of the British Medical Association last summer, there were six women more

or less advanced in pregnancy and of these only one aborted after the operation, and all recovered. I have chanced to see five other cases of operation on the genital organs during pregnancy, four in my own practice, one in that of my friend, Dr. M. D. Mann, before he removed to Buffalo.

In the *first* case, there being no evidence of pregnancy, I operated on a laceration of the cervix, removed the stitches on the eighth day and found union. Several days later the patient was seized with severe abdominal pain, sent for Dr. Mann (I being out of town, and hence my forgetfulness of the exact day) and miscarried at two and one half months, the cervix being again lacerated.

In the *second* case, I endeavored to remove a cyst of the anterior vaginal wall in a woman pregnant between two and three months. I decided to operate in spite of the pregnancy, or rather on account of that condition, because the patient told me that at her last confinement a couple of years previously, the same growth had increased so much as to delay the expulsion of the child's head, which did not escape until the physician punctured the cyst. Finding that I could not enucleate the cyst, I cut a piece out of its wall, swabbed it out with tr. iodine, and packed it with carbolized cotton. It gradually closed, and the patient did not miscarry.

In the *third* case, I examined a multipara for continual metrorrhagia and found a large epithelioma of the cervix, which bled so profusely that I was obliged to tampon the vagina with the greatest haste. I thus did not succeed in making a bimanual examination, but a few days later removed the cervix with the galvanocautery wire. On the sixth day after the operation I was called on account of pain and hemorrhage, and found that the woman had miscarried in the second month, the membranes being still retained. I removed them with the curette and she recovered from operation and abortion.

The *fourth* case was that of a woman who had repeated abscesses of the right Bartholinian gland, for which she did not seek relief until the abscess had burst and temporarily closed. After my telling her several times that she must have it opened and cauterized when it began to point, and failing to secure her attendance in time, she finally obeyed, and I opened the abscess in its whole length, cauterized its cavity thoroughly with a strong sol. of nitrate of silver, and packed it with carbolized cotton. In a week's time it was healed. After the operation, the patient informed me that she believed herself four months' pregnant, and such proved to be the case. It should be stated that the size of the inflamed gland would have prevented my making a digital examination before the operation. The pregnancy went on to term, and I delivered the child by forceps.

The *fifth* case is one in which I assisted Dr. Mann to sew up a lacerated cervix. The bluish tinge of the cervix was noted at the time, but no symptoms of pregnancy were stated and the possibility of that occurrence was not thought of. I did not make

a digital examination. As events proved, the woman must have been about two months pregnant at the operation, since she was safely delivered of twins at term, the time corresponding to the period mentioned.

Thus of these seven cases of operations on the genital organs of pregnant women, only two miscarried, both on the cervix.

An exhaustive essay on this subject by Dr. M. D. Mann will be found in the forthcoming volume (VII.) of the Transactions of the American Gynecological Society.

VII.—*Alarming Hemorrhage from Physiological Rupture of the Hymen.*

During the fall of 1881 I was called early one morning to see a lady who, as her husband informed me, had been married on the previous day. The first attempts at coition had failed, but towards morning a renewed effort was successful, and withdrawal was followed by a profuse hemorrhage from the sexual organs, which the husband attempted to check by packing towels firmly against the vulva. In this he finally succeeded, but not before the young wife had lost so much blood as to blanch her and place her in the half-fainting state in which I found her. Carefully removing the cloths, I endeavored to ascertain the origin of the hemorrhage, whether it came from the external genitals or from the depth of the vagina. Passing my finger into the vagina I found it distended and filled with coagula, the presence of which left me in doubt as to the site of the injury. I was therefore compelled to make a specular examination, both for diagnosis and to permit the proper hemostatic tamponade of the vagina. Placing the lady in Sims' position, I introduced his speculum, and with cotton in the dressing forceps removed the loose coagula in the vagina and attempted to discover the source of the bleeding. But the blood poured out so rapidly that I lost no time in plugging the vagina with flat discs of cotton already prepared, and thus arrested the hemorrhage. During this manœuvre the patient fainted again. The bleeding having entirely ceased, the patient was kept quiet until the next morning, when I removed the tampon through Sims' speculum, and then distinctly saw the rent from which the blood flowed. It ran from the left upper border of the hymen parallel to the urethra about one inch up the vagina, and was quite deep. The extension of the rent into the vagina accounted for the accumulation of blood in the vaginal pouch, which would not have been probable if the rupture of the hymen had been entirely external. As the bleeding again began, I applied a cotton plug soaked in saturated solution of alum directly to the wound, held it there by several tampons and a T-bandage, and the hemorrhage was permanently arrested. In a few days the lady was able to continue her wedding trip. Whether the bleeding returned at the next attempt I never learned, but do

not think it likely, as the Sims' speculum and tamponade had well dilated the vaginal entrance.

Accidents of this kind are rare; at all events the books refer only to occasional rupture of the vestibule by a fall on a sharp edge as a cause of dangerous hemorrhage in the non-pregnant woman. I have a recollection of hearing Dr. D. Humphreys Storer and Dr. Fordyce Barker, each mention having seen a case similar to the present one. But neither Thomas, Barnes, Schroeder, nor Hildebrandt in his monograph on Diseases of the External Genital Organs (Billroth's text-book on Diseases of Women) refer to serious bleeding as arising from physiological laceration of the hymen.

A NEW PROCEDURE FOR DISLODGING LOCKED TWINS.

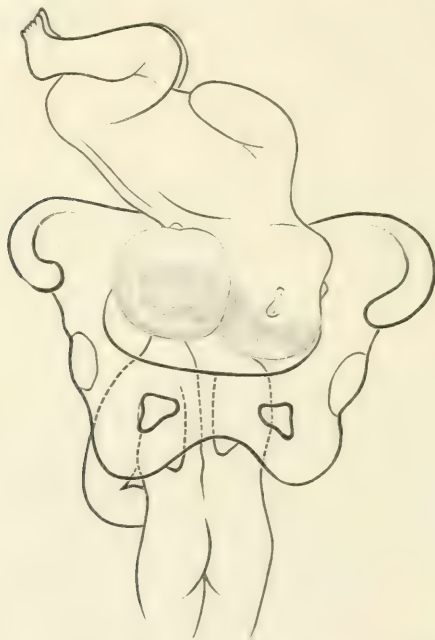
BY

T. S. GALBRAITH, M.D.,
Seymour, Ind.

EARLY in the morning, March 20th, 1880, I was called in great haste to attend Mrs. A., a German lady of medium size, aged 39, already the mother of seven children. I found the patient in labor, a midwife being in attendance, and a child delivered except its head. Twins, at that time, had not been suspected. The occiput of the child was to the front, with the chin extended, and in the right oblique diameter of the pelvis. The patient being upon her back, I made an effort to flex the chin, and deliver the head after the usual method, but was unsuccessful, the head apparently being immovably fixed in its position. I soon discovered that the head of another child occupied the cavity of the pelvis. The second child was presenting with the occiput to the front, and was driven down on to the neck of the first child so firmly as to completely bar any further progress of the labor. I endeavored to push the head of the second child upward and out of the way, but it was so firmly locked that it could not be moved by any reasonable amount of force. Acting on the principle so strongly advocated by E. R. Maxion, of Syracuse, N. Y., "that, by position, we could bring gravity to our aid in pushing back the head or body of a child during labor," I caused the patient to assume the knee and chest position, while I supported the lifeless body of the partly delivered child. On introducing my hand, I was delighted to find the obstructing head entirely movable, and I readily pushed it out of the way. To bring down the chin and

complete the delivery of the first child was the work of only a few minutes. It was still-born, however, and persistent efforts at resuscitation failed to revive it. The patient was placed upon her back again, and a half drachm of fluid extract of ergot administered. After waiting a short time, the pains being inefficient, and patient showing signs of exhaustion, I applied the forceps, and delivered the second child alive. The mother made a good recovery.

The above case was reported in the *American Practitioner*, May, 1880, and is now reproduced with the accompanying



woodcut to more fully illustrate the situation, and claim priority in the procedure. I have been personally assured by eminent authority that, up to the time of publication of this case, obstetric literature contained no record of the *knee-chest position* being employed to dislodge locked twins. In looking up the subject of this peculiar and dangerous complication in recent obstetrical works, we cannot but be impressed with the serious character of the measures recommended for its relief.

In Leishman, we are advised to decapitate the first child, allowing the head to recede, and deliver second child by forceps,

or reduce the head of second child by craniotomy (only justifiable when we believe the child dead), which will admit of first child being delivered. Lusk says: "Operative measures consist in applying the forceps, and extracting second head, and afterwards, if necessary, the first. In case of failure, craniotomy remains as an ultimate resort;" and Playfair says: "It may be possible to apply the forceps to the second head, and drag it past the body of the first child." The same method is recommended by Reimann (*AMERICAN JOURNAL OF OBSTETRICS*, Jan., 1877).

Extracting the second child by forceps, or any other method, seems impracticable when the pelvic outlet is occupied by the neck and shoulders of the first child. I do not presume that the successful practice of the knee-chest position in a single case is sufficient to establish an infallible rule, but the simplicity of the procedure, and its freedom from danger, certainly recommend it to a trial before resorting to the desperate expedient of craniotomy.

A NEW INTRAUTERINE STEM PESSARY.

BY

BERIAH EDWIN MOSSMAN, M.D.,
Greenville, Pa.

(With cut.)

FROM the great number of surgical instruments that have been invented, one would judge that almost every man in the medical profession, at some time or other in his professional career, must invent and have an instrument made. This will apply, in particular, to obstetrical and gynecological instruments, such as forceps and pessaries. Whenever an instrument will do all that is claimed for it, that is, meet all the requirements of the case, that is all we should ask, no difference whether it is made of rubber or steel or not, as appearance and excellence of finish have nothing to do with the value of it; for that must depend upon its utility in practice.

Of all instruments made, those that give the least satisfac-

tion, or, in plain language, are of the least practical use, as a class, uterine pessaries stand prominently foremost in the list; at least, this is my opinion. Such has been my experience with pessaries, and so far as my limited acquaintance extends, such has also been the experience of every physician who has given the subject of diseases of women special attention. Hence flexions and versions of the uterus are conditions difficult to treat with any particular degree of satisfaction. By this, I desire to be understood to mean that with the mechanical appliances at the command of the profession, results have been more unfavorable than favorable. It is true that a great deal of time has been spent by ingenious and hard-working practitioners to make pessaries that would answer for this or that kind of displacement, so that at the present time hundreds of such instruments are in use here and there, scattered throughout the world, each one offered as the instrument particularly adapted to particular cases. There is no question in my mind that the intrauterine stem pessary is the instrument best suited for the treatment of versions and flexions; it is rational, and I am led to believe that nearly all gynecologists consider it the best of all the mechanical appliances for these cases. Some two hundred different pessaries of this class have been made, so I have been informed by Dr. Ely Van de Warker, of Syracuse, who read a complete and descriptive paper on "The Use of the Intrauterine Stem Pessary in the Treatment of Versions and Flexions" at the meeting of the American Gynecological Society at Boston in 1877.

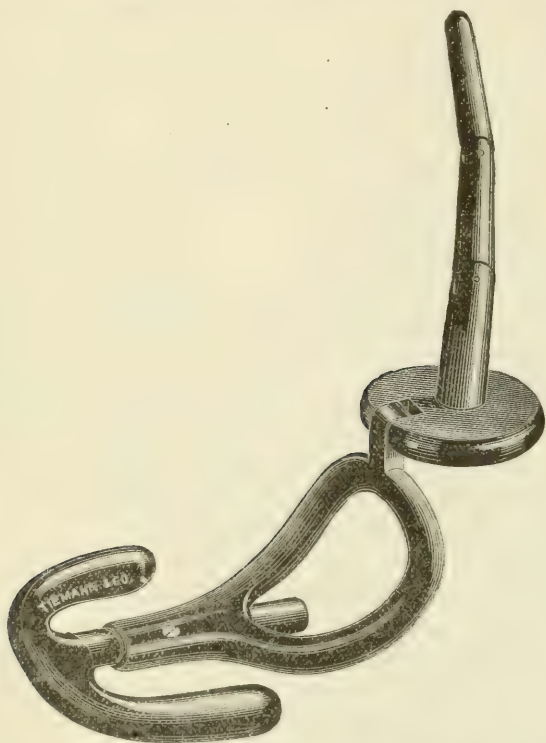
Years of failure, in the management of these cases, to restore the uterus to its normal position, and keep it there, with what I considered the very best stem pessaries, led me to carefully study the natural position of the uterus, the regional anatomy of the pelvis, and the means that support the organ in its position.¹ As a result of my investigations, I have had made a pessary, which I now take pleasure in bringing to the notice of the profession, believing that it is most probably the nearest to perfection of any instrument of the kind manufactured. With it, the uterus can be restored to its natural position, and kept there by purely vaginal means of support; at the same time it

¹ I believe the uterus is supported principally by the pelvic peritoneum.

is not held immovably in a fixed position. It is designed to treat retroversions, retroflexions, and lateral displacements.

The accompanying illustration shows the instrument perfectly, so that any person at a glance can see the principles upon which it was constructed.

The first thing to do in the treatment of versions and flexion is to restore the organ to its normal position, and the second is



to keep it there without injury to the uterus, the vagina, and without distress to the patient. All this can be done by this instrument. When the stem is introduced into the uterine cavity, unless adhesions exist, very little power will be required to elevate the uterus by using the instrument as a repositor. After it has been replaced, it can be securely held there by adjusting the anchor end of the instrument to fit the length of the vagina, and rest securely behind the pubic bone.

It is, my practise to measure first the depth of the vagina,

then adjust the pessary to the measurement. It will require considerable experience to do this without making several attempts before it can be accurately adjusted. After this has been done, I introduce a bivalve speculum that will admit of the introduction of the pessary through it, catch the uterus with a tenaculum, draw it down and forward within reach, then, with the other hand, introduce the stem within the external os. As soon as it has fairly entered the canal, the instrument can be turned upon its side to admit of the entrance of the anchor end through the vaginal orifice. When it is once in, it is not difficult to elevate the uterus and secure the pessary in proper position. The whole success will depend upon the instrument being accurately fitted to the uterine cavity and vagina. The stem should be at least a quarter of an inch shorter than the depth of the uterine canal. The arms of the anchor should be wide enough to prevent escape from the vagina. It is an easy matter to spread the arms by heating in hot water or holding over a spirit lamp, and then bending to suit. The most important point to be observed in applying the pessary is, to nicely adjust the proximal end to the length of the vagina, and not over-distend it. By means of the slide and screw, this can be accomplished. It is not intended that one instrument can be applied to every case—that would be impossible; different sizes are necessary. There is truly nothing new under the sun, and, in getting up this instrument, I have profited by the experience and inventions of others.

That this instrument is a superior one I am satisfied, and I know it will prove to be an indispensable instrument in the treatment of versions and flexion.

The particular points of excellence are :

1. It is a uterine replacer, and will at once correct the displacement.
2. It will keep the uterus in position without any restraint upon its natural floating motion, and will cause no distress nor discomfort to the patient.
3. By means of the adjustment, it can be made to fit the vagina accurately, or as near so as it is possible to do.
4. It can be readily removed without throwing the uterus down or displacing it, by means of the joints in the stem, and

in case of extreme flexion, the joints will admit of the stem being more readily passed.

5. The small size and lightness of the instrument admit of its being worn a long time without chafing or causing abrasions in the vagina.

6. The entire instrument is within the vagina, and is worn without any knowledge of its presence.

GREENVILLE, PA., Sept. 12th, 1882.

APPENDIX TO
AMERICAN OVARIOTOMIES.

[THE cases of the late Dr. E. R. Peaslee and those of Dr. Washington L. Atlee could not be compiled in time for the July number. Those of Dr. Peaslee have since been collected and sent to Dr. Bigelow by his son, Dr. E. H. Peaslee, and his partner, Dr. J. E. Janvrin, and those of Dr. Atlee by his son-in-law, Dr. T. M. Drysdale, who has added his own numerous cases. The total number of these cases (576) is so large as to warrant adding them to the list already published, especially as they have never been reported in full.—ED.]

Cases of DR. E. R. PEASLEE.

Dr. Janvrin writes:—"It has been a matter of considerable difficulty to collect a satisfactory report of the ovariectomies of the late Dr. E. R. Peaslee.

With considerable research by his son, Dr. E. H. Peaslee, and my own recollection of a large number of the cases in which I had the honor of assisting in the operation, I believe I have a pretty correct tabulation of the cases.

In Dr. Peaslee's work on Ovariectomy, published in 1872, he reported 28 cases of his own up to Oct. 10th, 1871. Of these cases, 19 recovered and 9 died.

From October 10th, 1871, to January 10th, 1878 (ten days prior to his death), he operated 48 times. 33 were married and 15 single. The youngest fifteen years, the oldest seventy-three years. Of these 48 cases, 19 recovered and 29 died.

There were 7 *double* ovariectomies, with 4 recoveries and 3 deaths, and 1 'Battey's operation,' which latter terminated fatally.

Nearly every one of these last 48 cases were multilocular.

Laparotomy performed in every case. Listerism in 1 (Jan. 5th, 1878). Recovery. One case is marked 'malignant.' Death in thirty-six hours. Several dermoid. Fully one-half were colloid. Pedicle treated by ligature in nearly every case.

Extensive adhesions in nearly every case. Only 1 case in which there were no adhesions.

Drainage by tent or tube in lower end of abdominal incision in about one-third of the number.

Twenty-four of these 48 were operated upon at some distance from New York, and left in the hands of other physicians for after-treatment. Nearly all were known to be of long standing, and many had been previously tapped; several, many times; the operation of ovariectomy having been resorted to only as a last hope. Hence the severe complications, adhesions, etc.

Among the causes of death, I find mentioned: Two hemorrhage, 8 peritonitis, 1 septicemia, 1 heart-clot (8th day), 1 sloughing of pedicle, 1 diarrhea, 1 'malignant' (mentioned above), 1 died on table just as operation was completed. Of the remaining 13 deaths, I find no record as to cause. Of the whole 76 cases which we have been able to collect, 38 recovered and the same number died.

Although the percentage of recoveries is much smaller than that of many operators of the present day, when we take into consideration the extreme severity of the cases and the exhausted condition of the greater number of the patients from previous tapplings and the long deferred radical operation, we could hardly expect to find a better showing.

Many of these cases coming into Dr. Peaslee's hands after years of suffering, to my own knowledge, were operated upon when there was scarcely a chance for recovery."

Cases of DR. WASHINGTON L. ATLEE.

Number of operations (from March, 1844, to May, 31st, 1878), 387; married, 288; single, 99. Age: four, 15 years; oldest, 69 years; 76 over 50, and 16 over 60. Nature of tumor: 8 dermoid, 22 cancerous, 5 ovarian fibroids, 17 cysts of

broad ligament, 92 ovarian monocysts, 234 multilocular, 9 complex, uterine and ovarian. Tapped or aspirated by himself or others, 205. Preliminary treatment: the administration of iron, generally the tincture of the chloride, for a few weeks before the operation, and the use of a gentle purgative, such as castor oil, the night before the operation. After the bowels were evacuated, an opiate was given. After this, the patient was allowed nothing but milk or tea and bread.

The anesthetic, which he preferred and generally used, was his mixture of one part of chloroform and two parts of sulphuric ether, by measure. Bichloride of methylene, sulphuric ether, and chloroform were used in a number of cases.

Exploratory operations commenced, and abandoned on account of adhesions, to overcome which a fatal result was inevitable, 9; cancerous and universally adherent, 6 = 15. Laparotomy used in all but one case. Listerism never employed. Weight of tumor, from 4 pounds to 128 pounds. Clamp used in 270 cases; ligature in 47 cases; écraseur in 19 cases; enucleation in 10 cases. Pedicle transfixed with needle and retained in wound; cautery, galvanic cautery, wire ligatures, vessels ligated separately, torsion, and other methods, 41 cases. Drainage was used when the adhesions were extensive. After-treatment: an opiate was given immediately after the operation, and repeated when necessary to control pain; the diet was carefully regulated. Results: 127 deaths, 260 recoveries.

Causes of death: shock and exhaustion, 20; septicemia, 39; peritonitis, 47; embolism, 4; hemorrhage, primary and secondary, 8; hemorrhage of bowels, 22d day, 1; obstruction of bowels, 5; overdose of opium and morphia (given by mistake of nurse in one case, and in the other by mistake of mother of patient), 2; congestion of lungs, 1.

He operated on 17 cases of ruptured cysts; of these, eight recovered and nine died. In six cases, ovariectomy was performed twice on the same patient; the first of these had been previously operated upon by Clay, of Manchester. He removed both ovaries in 27 cases. Uterus and both ovaries removed in 5 cases; of these, 3 died, 1 of them cancerous, and 2 recovered. Adhesions: free from adhesions, 47; the remainder were adherent. The short incision was preferred by

Dr. Atlee, and the reduction in the size of the cyst by evacuating its contents before extracting it.

Cases of Dr. THOMAS M. DRYSDALE, of Philadelphia.

Number of operations (from April, 1861, to September, 1882), 113; married, 96; single, 17. Age: youngest, 17 years; oldest, 65 years. Nature of tumor: multilocular ovarian, 66; unilocular, 26; dermoid, 5; cancerous, 6; colloid, 4; cyst of broad ligament, 6. Tapped or aspirated, by others or myself, all except 4. Preliminary treatment: the use of iron and other tonics, and supporting diet, otherwise the same as given in the statement of Dr. Atlee's cases.

Anesthetic used: in the early cases the mixture of two parts of sulphuric ether and one part of chloroform, by measure. Since 1874, sulphuric ether alone.

Exploratory operations: 2, 1 a uterine fibroid with such extensive adhesions that its removal was necessarily fatal; the other a dermoid tumor, universally adherent and communicating with the bowel by a large opening; both of these cases recovered. Laparotomy used in all. Listerism used in every case since May, 1879. Weight of tumor: from 20 pounds to 97 pounds. Treatment of pedicle: clamp used in 93 cases; ligature in 17 cases; and in 3 cases secured to external wound by suture. Drainage was used when extensive adhesions and oozing surface made it necessary. After-treatment: when pain required it, an opiate; a carefully regulated diet, and the use of tonics if needed. Results: 19 deaths, 94 recoveries.

Causes of death: shock, 2; septicemia, 10; peritonitis, 4; embolism, 1; exhaustion, 2.

Two of the above cases were second ovariectomies; both recovered. Two cases of cancer recovered; one died in fourteen months after the operation of cancer of the colon, the other in six months of general abdominal cancer. A case which had suffered from chronic peritonitis before the operation recovered. Two were double ovariectomies. In one the uterus and both ovaries were removed.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

(A B S T R A C T .)

SEVENTH ANNUAL MEETING.

HELD IN BOSTON, SEPTEMBER 20TH, 21ST, AND 22D. 1882.

First Day—Morning Session.

THE Society met in the Hall of the Boston Society of Natural History on Wednesday, September 20th, and was called to order at 10 A.M. by the President, Dr. Thomas Addis Emmet, of New York.

THE ADDRESS OF WELCOME

was given by DR. G. H. LYMAN, of Boston.

THE PROPER USE OF ERGOT IN OBSTETRICS.

DR. JOSEPH TABER JOHNSON, of Washington, D. C., read a paper on the above subject, remarking that he had nothing new to offer, but hoped to bring the knowledge already possessed into such shape as to show the powers of the drug for good and for harm, and to attempt the formulation of a few safe rules for our guidance in its administration to women in labor. With its other uses the paper did not deal. The author then referred to the different teachings concerning the use of this drug: some advising it to hasten slow pains in the first and second stages of labor; others saying that it should never be given in these cases; some trying to overcome uterine inertia with it; while others say that it is little short of murder to give it when the child is viable; some advising it to expel a retained placenta, to give it immediately after the birth of the child as a prophylactic against hemorrhage; while others say it does harm in these cases. etc.

In the beginning it would be desirable to ascertain what is the real effect of the drug upon the muscular fibres of the uterus and upon the child within its cavity. There is an agreement in the statement that it produces in the uterus already in labor a persistent tonic contraction which, if sufficient be given, finally becomes tetanic in character; also, that a kind of contraction is produced that is diametrically opposite to the rhythmical contractions of the normal parturient uterus. In the persistent tonic contraction produced by ergot, all the muscular fibres of the uterus are contracted equally upon its contents, which are held, as it were, in a vice, instead of being expelled in the normal manner. In some cases, the child has been suddenly expelled after its use. In the alternating relaxation of the uterine tissues and the recession of the presenting part does the safety of the process of

parturition consist, as no one had shown more satisfactorily than Dr. Emmet that the great danger in long-continued pressure was necrosis of the part, and whether vaginitis, pelvic cellulitis, or sphacelus occurred could be determined by the length of time these tissues have been compressed and their nutrition interfered with.

Ergot has frequently been substituted as the proper alternation for the forceps in cases of delay or uterine inertia.

The danger of abscesses in cases of this kind has been pointed out in a monograph published several years ago by Dr. Barker, and that subject might occupy the entire time allotted to those points which he now proposed to consider.

Undoubtedly cases have occurred in which ergot has driven the child through the soft parts so suddenly as to produce any or all of the lacerations combined in a single case, from rupture of the uterus to the complete rupture of the perineum, and he would not stop to quote cases to confirm the statement. The uncertainty of the action of the drug was one of the principal dangers of its use. It may act upon part or upon the entire organ. Upon its introduction into the obstetric practice of this country by Dr. Stearns, there seemed to have been a general acceptance by the profession that ergot would originate and intensify uterine contractions, and, therefore, was *the* remedy to administer in cases of uterine inertia before and after delivery. In some quarters warning notes were sent out that it was the cause of many still-births and other accidents during labor. The author of the paper then referred to the views upon these points as presented in some of the text-books, etc. He knew teachers who lectured to their classes upon the criminality of the use of ergot before the birth of the child. He knew physicians who forbid its use in maternity hospitals until after the birth of the placenta. On the other hand, he so firmly believed the opposite of this custom prevails to an alarming extent throughout the country, that this paper was given as an additional warning. His attention was drawn emphatically to this subject by a case of his own several years ago. The labor was progressing in what appeared to be a normal manner in a stout woman, when the pains getting to be less effective and the condition of inertia impending, he gave a drachm of the fluid extract of ergot. Not much effect was produced, and more was given. In all about half an ounce was used. No real pains were produced, but the uterus from being soft became hard, and continued hard. The woman was in pain all the time, but occasionally it was worse. The tonic action of the uterus continued, and the child was squeezed to death, and was delivered by the forceps. Several illustrative cases were then given; some of them furnished by a brother practitioner.

As far back as 1845, Joseph A. Eve wrote an exhaustive paper, in which he warned the profession against the too frequent and indiscriminate use of ergot, alleging that many still-births were produced by it. Other authorities were then quoted, showing that ergot might kill the child.

In cases of retained membranes after abortion, he was positive that the labor of their extraction had been made tenfold more difficult, and to that extent dangerous, by giving ergot with the expectation of causing their immediate expulsion. It would be much safer to rely upon other means, or, if there be hemorrhage, to tampon the vagina and await the action of nature, watching for symptoms of danger.

As a prophylactic against post-partum hemorrhage, we cannot rely upon it. The time required for it to act, and its liability to produce vomiting placed it far below other means. So far as his own opinion was concerned, he thought the human race would be much better off if ergot should be utterly abolished from the lying-in room. It should certainly never be given to a primipara. It would be safer to give it to no woman in labor; but in careful hands, and when its powers are fully known and its dangers appreciated, it might, perhaps, be prescribed in the second stage with advantage to overcome uterine inertia, but then only in cases when the soft parts are relaxed, and where it is quite certain that the child will be born within half a dozen vigorous pains. Even then, for the proper protection of the child, frequent auscultation should be practised, and upon its heart becoming slowed or enfeebled, delivery should at once be completed by the forceps.

The use of ergot is contra-indicated in retained placenta. He believed that it delayed involution and made after-pains worse by keeping up a painful state of contraction.

In placenta previa, or accidental hemorrhage, it is not indicated if the child is viable or the possibility of preventing its birth exists.

Ergot will retain a place among our remedies so long as uterine hemorrhage occurs from relaxed uterine muscular fibre, but in these very cases the woman's only safety is in emptying and firmly contracting the uterus. The action of ergot previous to its complete evacuation interferes with, if it does not for a time prevent, manual efforts necessary for the turning and extraction of the child and placenta. Should bleeding continue subsequently, ergot is indicated.

DR. JOHN P. REYNOLDS, of Boston, bore witness to the facts so carefully stated by Dr. Johnson, but he thought there were exceptional cases which should be remembered. First, where the accoucheur of experience knows that the child and the passages are properly proportioned, the soft parts are in proper condition, there is no history of special complications in other labors, etc., the use of ergot will produce good results; but in saying that, he did not mean to be understood as speaking of the use of the drug in such doses as had been mentioned. Five to ten drops of the fluid extract given and repeated at short intervals, with careful watching of the effect, will soon show whether the case is one which promises any good results from the use of the drug.

Still further he was inclined to use ergot in cases in which anesthetics have necessarily been employed.

DR. FORDYCE BARKER, of New York, thought it impossible to

lay down positive rules, to which there were no exceptions, concerning the use of any remedy. He thought it agreed upon that ergot should not be used in advanced parturition under certain circumstances, that it should never be used to induce uterine contraction in the first stage of labor, never be used except in vertex presentations, never where there is the slightest disproportion between the fetus and the passages of the mother, never unless the soft parts of the mother are perfectly prepared for dilatation, never unless all mechanical conditions are such that, if sufficient uterine force exists, the fetus will be expelled rapidly, say within half an hour. All these principles are fixed at the present among obstetricians. But when he heard it held and laid down that ergot should absolutely never be given for the purpose of exciting the uterus to contract, he thought it was going a little further than he should deem wise. It was exceedingly rare that he gave ergot for the purpose of expelling the fetus, but there were some exceptions in which he thought that he had done so with great advantage. There were cases in which labor ceased, not so much from lack of uterine muscular force as from exhaustion of nerve force, due to undue sensitiveness to pain. In such cases, *all other conditions being favorable*, he anesthetizes the patient moderately, and then gives ergot to stimulate the uterus, and soon the accessory muscles begin to act, and the case terminates successfully. If there is delay in such cases, he uses the forceps.

Again, there was one point in which he disagreed with the author, although agreeing with him in nearly all, namely, that ergot favored after-pains, and increased the suffering of the woman. He habitually administered ergot after delivery, and for the purpose of securing permanent contraction of the uterus, preventing effusion of blood into the cavity, and thus preventing after-pains. Dr. Barker then referred to the influence of ergot in promoting rapid and speedy involution.

DR. W. T. HOWARD, of Baltimore, said that he had never in a single case used ergot for the purpose of increasing the expulsive powers of the uterus. It had been his practice, whenever he wished to increase the expulsive forces, to employ the forceps, because when the action of ergot is established, it never ceases. It was his custom also to use ergot if an anesthetic was employed in labor.

DR. J. D. TRASK, of Astoria, N. Y., said that it had been his practice to use the forceps instead of ergot as an accelerator of uterine force. In the early years of his practice, he preferred ergot, but the drug was so uncertain in its action that he had abandoned its use for this purpose. He was also in the habit of giving a drachm of the fluid extract of ergot immediately upon the expulsion of the head of the child, for the purpose of securing complete and permanent contraction of the uterus after delivery of the placenta. He was completely surprised at the experience of Dr. Barker concerning the use of chloroform. With him (Dr. Trask), there had been a growing mistrust of the article for years,

and he scarcely ever gave it without being made soon aware of inefficiency of uterine contraction.

The discussion was closed by DR. JOHNSON, who remarked that he had brought the subject forward simply for the purpose, if possible, of attracting the attention of men who either do not understand or fully appreciate the dangers arising from the use of ergot in obstetric practice.

The Secretary, DR. JAS. R. CHADWICK, of Boston, then read a paper sent by DR. R. S. SUTTON, of Pittsburgh, Pa., and entitled

SOME REMARKS ON THE TREATMENT OF THE PEDICLE IN
OVARIOTOMY.

From a careful study of the case of Dr. Robert Houston, of Glasgow, he was unable to find that the pedicle was treated in any special manner. That he did in 1701 attack and destroy a cystic tumor of the left ovary, there was no doubt. There was no return of the disease, and his patient lived for thirteen years after the operation. From the study of the history of the case, Dr. Sutton concluded that Dr. Houston unconsciously performed enucleation of the lining membrane of the cyst, and directed no further treatment to the pedicle. After Dr. Houston's achievement, the interest in the case was kept alive by John and William Hunter, and subsequently by John Bell. In 1794, Ephraim McDowell was a student of Prof. John Bell, and heard him defend the feasibility of removing cysts by abdominal section, and in 1809 McDowell performed ovariectomy, the first systematic operation ever performed for the removal of an ovarian cyst, and it was nearly as perfect an operation as is done to-day. He tied the pedicle with a single ligature, the end or ends of which were left hanging out at the lower angle of the wound. For eleven years after this operation, no other method of treating the pedicle was suggested. In 1820, Chrysmar, of Wurtemberg, tied the pedicle in two portions, but left the ends of the ligatures hanging out at the lower angle of the wound. In 1821, Nathan Smith, of New England, tied separately the arteries of the pedicle with strips cut from a kid glove, cut the ligatures close to the knot, dropped the pedicle in, and closed the wound. During the following sixteen years, the three methods mentioned were followed. Stilling, in 1837, used the cautery, and suggested stitching of the pedicle in the wound. In 1846, Dr. Handyside, of Edinburgh, carried the ligatures through the *cul-de-sac* of Douglas into the vagina. In 1848, Stilling treated the pedicle for the first time outside of the abdominal cavity. In 1850, this method was inaugurated in London by Mr. E. W. Duffin. In 1849, Maisonneuve had twisted the entire pedicle in one case, and Martin, of Jena, had stitched it into the wound. About this time, Langenbeck stitched the pedicle into the wound, and covered it with skin from the margin of the incision. In 1850, Washington L. Atlee introduced the use of the *écraseur*, and was followed by Wells, Keith, Pope, of St. Louis, and Billroth. In

the autumn of the same year, Mr. Jonathan Hutchinson invented the clamp. In 1860, Sir James Y. Simpson secured the pedicle within the abdominal cavity by means of acupressure needles. In 1865, Koeberlé, of Strasburg, invented his wire constrictor, by which he grooved the pedicle for the reception of the ligature. In 1864, Baker Brown, of London, began to use the cautery. In 1868, Maslovski amputated the pedicle by means of double flaps, and stitched the flaps together. In 1869, Macleod, of Glasgow, twisted the pedicle entirely off by means of strong forceps. Many other methods were mentioned. During the last ten years, it has been treated in a great variety of ways; but at last surgeons have concluded to do with it what McDowell did, namely, to tie it with a ligature, leave it inside of the belly, or, following Nathan Smith (1821), in cutting off the free ends of the ligature. The question has now resolved itself into the merits of the ligature cut short or the clamp cautery as introduced by Baker Brown in 1864. The methods of various surgeons were then mentioned.

In conclusion, the paper referred to certain conditions which are favorable or unfavorable in reference to ovariectomy, and of great importance. Among the conditions leading to success, he placed the following: 1, climatic influences; 2, avoidance of the clamp; 3, drainage; 4, the judicious use of purgatives after the operation (dangerous ground); 5, the judicious use of opium; 6, the presence at the operation of only those whose presence is required; 7, a good assistant, and always the same one; 8, careful administration of the anesthetic; 9, absolute cleanliness as to person, sponges, and ligatures; 10, avoidance of the operation in public hospitals; 11, performing the operation in well-regulated private hospitals; 12, avoidance by the operator and his assistant of all septic diseases and of the examination of women who are menstruating or having leucorrhœal discharges; 13, the proper application of the ligature and cautery; 14, complete cleansing of the cavity of the peritoneum after operating. Among the conditions leading to failure, he would place prominently: 1, climatic influences; 2, extra-peritoneal treatment of the pedicle; 3, insufficient regard to proper drainage; 4, constipation not relieved prior to the operation; 5, the injudicious use of opium; 6, the presence of a crowd; 7, want of cleanliness; 8, overdoses of anesthetics; 9, hospitalism; 10, septic contamination of operator, assistant, or nurse; 11, insufficient experience in operating, or want of practical knowledge of the operation; 12, changing assistant or nurse; 13, performing the operation at any time or place opportunity offers; 14, repeated tapping of the cyst; 15, delaying the operation too long; 16, operating in the presence of organic diseases of other organs, especially of the kidneys.

MR. THORNTON, of London, could not conceive it possible that he should give up the spray, because it enabled him to dispense with the drainage-tube. Theoretically, he was in favor of the cautery, but he must say that unless the case was treated antiseptically, he should be afraid to leave the charred piece of tissue. He had, however, had the most practice in the use of

the ligature, simply carbolized, and dropping the pedicle. He had come to regard this method so safe that he used it steadily, and had not lost a patient, except one having malignant disease. It was a mystery to him how the unfavorable results had been obtained in the use of the carbolic spray. He was especially desirous to learn the experience of American operators concerning the influence of climate in these cases. He had been in the habit of giving opium freely, in the after-treatment, and trusted to enemata rather than the use of purgatives.

DR. KIMBALL, of Lowell, regarded the spray of doubtful advantage. He had tried every method of treating the pedicle mentioned, and partly from his own experience, more from that of others, had come to adopt the plan of dropping it into the abdominal cavity. Concerning climatic influences, there must be some such reason why European operators had been so much more successful than the American, and he was of the opinion that climate had much to do with the results.

The Society adjourned to meet at 3 P.M.

First Day—Afternoon Session.

The first paper was read by DR. THEOPHILUS PARVIN, of Indianapolis, and entitled,

THE CARE OF THE PERINEUM IN THE SECOND STAGE OF LABOR.

One of the most important duties of the accoucheur, in the second stage of labor, is the preservation of the vulvo-vaginal orifice from injury during the passage of the head and shoulders of the fetus, or if injury must be done, to make it as slight as possible. Duncan and Schroeder had shown that in primiparæ some tearing of the vaginal orifice is inevitable; only thirty-nine per cent of women in their first labor, according to Schroeder, escaping rupture of the fourchette. Besides, there may be serious rents in various directions, but the perineum is specially liable to rupture in the median line, for there is the greatest distention, and also the tissues in this region are the farthest from their points of attachment. Even where the perineum receives no injury at once apparent it may have been subjected to such pressure and distention that, though entire even for a few days after delivery, it finally gives way and the resulting condition is similar to a laceration.

In regard to frequency of rupture, it was still an unsettled question. Many practitioners asserted that, after attending many hundreds of cases of labor, they had never had a case of rupture of the perineum—an assertion which can never be accepted unless the party making it can also state that he has carefully examined the perineum in every case immediately after labor. Dr. Parvin then proceeded to give the statistics of several eminent obstetricians upon this point. He then directed attention to the causes of laceration of the perineum, such as those which relate to the pelvis and the condition of the soft parts, to the fetus, and to the

character of the labor. The great majority of perineal lacerations are caused by precipitate delivery, force too great, time too short, the expelling power overcoming the resisting power, not by stretching but by tearing. In order to prevent or reduce this accident to the minimum, it was the duty of the accoucheur to hinder the abrupt expulsion of the head of the fetus and permit gradual dilatation of the passage which it traversed. One of the first things to be done is to have the patient upon her side, generally upon the left. The advantages of the side position are, lessening abdominal pressure and preventing the wide separation of the knees. Pressing with the feet, or pressing upon the knees by another person must be forbidden. Frequent respiration and abstaining from all bearing-down efforts must be enjoined, and if the woman does not refrain from the latter an anæsthetic should be used. If the dilatation be insufficient, the head is to be held back, and it is to be guided during its exit in the axis of the vulva. The reader of the paper then referred to the various directions given by authors, such as "applying pressure to the head with one hand and with the other supporting the perineum," "using the forceps for regulating the descent of the head," "preserving it by preventing its lengthening," "pressing the tissues about the anus," "hooking two fingers into the rectum and drawing the perineum forward while the thumb of the hand restrains the advance of the head if necessary," etc., etc. Dr. Parvin objected to the use of the fingers in the rectum because of the increased excitability which they produced. Finally, protection of the perineum was to be sought by supporting it during the expulsion of the head and shoulders. This practice he believed to be in accord with that of the immense majority of the profession. Nevertheless it has been condemned by some of the most eminent living obstetricians. Supporting the perineum is really strengthening a weak part of an elastic ring, and relieving it of excessive strain. The hand should be applied directly and with no intervening napkin. Support should be given only at the close of the second stage and only during a pain. He then described his method of manipulation.

When rupture is otherwise inevitable, it has been advised to prevent the accident by an incision or incisions. This operation was really first proposed by Ould in 1742. Most operators have advised lateral incisions, but Tarnier observed that they did not always prevent extensive lacerations, that they might leave a deformity and painful cicatrices, or the duct of one of the vulvo-vaginal glands might be injured, causing a fistula, and he therefore advised incision, beginning at the raphe, turning obliquely toward the side so that if laceration follow it will not involve the anal sphincter. Episiotomy should not be resorted to unless it is indispensable, because incised parts may be covered with eschars and become the medium of grave infectious diseases. In the light of the views of McClintock, the conditions for episiotomy might, perhaps, be such as given by Coleridge for Cesarean section. First, "that the surgeon should possess infallible knowledge of his art," and second,

"that he should be infallibly certain that he is infallible!" However, episiotomy might save the anal sphincter and might save bruising of the tissues from the possible prolonged pressure before rent occurs. As to the frequency with which this operation is required, obstetricians differ greatly.

In case rupture occurs, the importance of an immediate operation has been conclusively shown by the statistics adduced by Dr. Noeggerath. Dr. Parvin thought that horse-hair would probably answer quite as well as any other material for sutures. Certainly it was generally readily obtained.

The paper being before the Society for discussion, Dr. A. H. SMITH, of Philadelphia, remarked that he had been very much interested in the paper read by Dr. Parvin, as it was a subject which certainly interested all obstetricians. With reference to the question of rupture and the management of the second stage of labor, he had always felt that it was a question of the management of the head of the child rather than of the perineum, and that the main thing was to keep the head from pressing against the raphe of the perineum. It was well known that lateral lacerations were comparatively rare, and when they occurred they were comparatively harmless. The laceration which was feared mostly was that in the region of the raphe, because there we have not only division of the perineal body, but may have separation of the sphincter back into the rectum. If we can divert the laceration into the lateral portion of the vulva, if it must occur, we avoid two serious accidents. The object of the obstetrician, as already said, is to divert the pressure toward the lateral portion of the perineum, and the question is, How can this be done most effectually? It can be most effectually accomplished by bringing pressure to bear upon that part of the head which presses upon the median portion of the perineum, and this can best be done by placing the patient upon the left side and making pressure upon the presenting portion of the head with the thumb and fingers upon the occiput, so as to divert the pressure from the raphe to the lateral portion of the perineum. In this way we can change the shape of the child's head and so carry the pressure away from where it is most dangerous and bring it to bear upon the part where it is least dangerous. We can also make a certain amount of pressure upon the perineum, and this should be away from the tissue where we wish to avoid the laceration. By some, pressure is made upon the vulva with the palm of the thumb upon one side and that of the fingers upon the other, and so loosening the tissues which are at the same time being pressed upon by the head of the child in the median line. Continuing these manipulations, we can in the vast majority of cases remove the danger of rupture of the perineum. The method of introducing the finger into the rectum is a good one when the perineum is very rigid; at the same time we also have opportunity to carry the perineum over the head of the child when the spasmodic contraction of the uterus is not driving it against the perineum. If we avail ourselves of the absence of the pain, we can slip the perineum over

the face of the child and in that way greatly assist nature in the process. With regard to incision of the perineum, he was thoroughly in favor of it. He had seen so many cases in which posterior laceration has been prevented by incision in the vulva that he should resort to it whenever necessity seems to require it. Of course, we should be satisfied of the necessity of the operation before making the incision. His custom had been to make it about one-third of the distance between the raphe and the clitoris upon either side, and he had seen cases where he knew the perineum would not have been saved had not the incision been made, and he had seen cases in which even after deep furrows had been made in the tissues, the head has passed over the perineum without injury to the fourchette. As to the after-treatment, that was a question which depends upon the extent of the incision. He was in the habit generally of applying a strong solution of carbolic acid for the purpose of forming an eschar and preventing absorption from the vaginal canal, and where the incision is deep he unites the edges by deep silk sutures. He felt satisfied that in many cases he had saved by these incisions deep rents through the sphincter backward.

DR. JAMES R. CHADWICK, of Boston, had always regarded the term "supporting the perineum" as a misnomer. It had always seemed to him that the entire secret of laceration of the perineum was to prevent too rapid passage of the head of the child, as had already been mentioned by Dr. Parvin.

DR. W. T. HOWARD, of Baltimore, said that he believed the best method of preventing rupture when the perineum was rigid, was to put the patient profoundly under the influence of an anesthetic. When the perineum is frangible, place the patient upon the side with a pillow between the knees, profoundly anesthetize her, and the perineum will so relax that the head usually passes without causing rupture. Dr. Howard then directed special attention to the liability of the shoulders producing rupture of the perineum, and to the necessity of delivering one shoulder as soon as possible, in order to avoid the pressure which that broad portion of the body produces. Since he had adopted that particular item in practice, he had avoided laceration of the perineum almost invariably. He also advocated the primary operation for the restoration of the laceration.

The discussion was closed by DR. PARVIN, who, in reply to one of the points made by Dr. Chadwick, said that he regarded the term "supporting the perineum" as one which could properly be retained in our nomenclature, as the manipulation was essentially supporting the perineum.

DR. FORDYCE BARKER, of New York, then read a paper on

LEUCORRHEA: ITS CONSTITUTIONAL CAUSES AND THERAPEUTICS.

It had seemed to the author that the fact that it was not a distinct disease, but a symptom of many different and even opposite pathological conditions, had led to a neglect in its study, and practically to a forgetfulness of the fact that it not rarely originates

from constitutional causes, and that, when long-continued, it became itself a cause of local and important pathological changes. In the works of Sir Chas. Mansfield Clark, Dr. Ashwell, Henry Bennett, and Tyler Smith, the affection was most fully considered, but the work of the last of these writers was published more than a quarter of a century ago, and no writer on diseases of women since that time has considered it except incidentally as a symptom of some local disease, with the exception of Courty, Stoltz, and Robert Barnes, who had called attention to some of its constitutional causes. This was equally true of American, English, French, and German gynecologists. The great improvement in physical exploration, resulting from the introduction of Marion Sims' methods, the use of uterine sounds, etc., had led to a careful study of certain organic changes in the pelvic organs, and seemed to have been attended with a corresponding neglect of some other equally important points, and consequently associated therapeutics. During many years past, he had seen and treated many patients who had, without doubt, received the best surgical treatment from men whom all regarded as most eminent. Some had had the cervix incised, others had had it sewed up, others had had the cavity of the uterus scraped out, etc., and no doubt had been greatly improved for a time, but, finding that their symptoms returned, they had gone back to their former physician, and had again received local treatment. A large proportion had thought themselves cured, but, after a period varying from months to years, the leucorrhea, the backache, the irritable condition of the bladder, and the nervous disturbance had returned as badly as before. It was frankly to be confessed that some of this class were not generally interesting, either as patients or cases, and he felt a pity for himself when he had such to treat, although some practitioners seemed more happily organized and also able to build up a fine practice from just such material. Leucorrhea is the most constant of all symptoms complained of by this class, and usually it is regarded by them as being the most important, as being the cause of the debility, headache, etc., etc., and he was inclined to believe that there was a larger measure of truth in their theory on this point than was usually considered by the profession, for, in many, but slight evidence of any organic disease, either through change of tissue or position, had been found to explain the symptoms. In a certain proportion, careful inquiry brought out the fact that, for a while after treatment, they had been quite free from all symptoms of disease, and that the first which attracted attention was the recurrence of the leucorrhea, followed by backache, debility, etc. In some, he had found painful and scanty menstruation, in others, profuse discharge or diminished interval between each catamenial period, and in these cases there was always found some pathological condition of the organs of the pelvic cavity, and yet many of these disappeared after adoption of constitutional treatment, without any local applications except vaginal injections. For many years he was an entire disbeliever in the opinion of Tyler Smith, that leucorrhea

was, in many cases, a primary cause of morbid states of the os and cervix, and while now he was not at all disposed to accept the statement that this is the fact in a majority of cases, yet within the few last years he had been convinced that it was true in some. Tyler Smith had expressed the belief that he was the first to call attention to the fact that long-continued leucorrhœa slowly induces inversion of the canal of the cervix, thus causing increased pain and distress. All would remember, however, that this condition which had also been called the "cockscomb" appearance, had been carefully described by Dr. Emmet as one of the results of old lacerations of the cervix uteri, and probably this was the unrecognized fact in the cases reported by Tyler Smith. Dr. Barker then referred to a case of this kind, which had been successfully operated upon by Sims and Emmet, and subsequently, from special causes, became broken down in health, and suffered from leucorrhœa, which was cured by constitutional measures and vaginal injections.

The influence of leucorrhœa in developing disease of the pelvic organs may have been over-estimated by Tyler Smith, but clinical experience had taught Dr. Barker that Smith's views had more foundation in fact than he was formerly inclined to grant. The history of a case which came under his notice several years ago was then given. The woman had been treated with benefit temporarily by means of local applications every fifth day, and finally she thought herself cured, although the leucorrhœa was not perceptibly less. She returned home, and soon all her bad symptoms reappeared, and she suffered extremely from neuralgic pains, due to anemia and very profuse and irregular menstrual loss. The cervix was resting on the perineum, very much enlarged, presented the so-called "cockscomb" granulations, and she suffered from gastric disturbance and obstinate constipation, hemorrhoids, etc. She proved to be a patient "not transferable," and, therefore, he prescribed such constitutional remedies as seemed necessary to correct gastric disturbance, overcome constipation, and relieve hemorrhoids, and she was advised to pass the summer at Long Branch. Her condition was such that sea-bathing was impossible, but she was directed to have herself sponged daily with sea-water and to inject a quart of sea-water into the vagina night and morning. Within two months her physical appearance was entirely changed, and she was able to walk. The change in the physical appearance of the pelvic organs was equally remarkable, and she had been unconscious of leucorrhœa for several weeks. This case had been instructive to him, especially where circumstances had not permitted the use of any local treatment. He had seen leucorrhœa and various morbid conditions of the os and cervix disappear by the use of proper hygienic measures and such treatment as was indicated for the improvement of the general health. While he accepted the statement that local and constitutional causes continued to develop leucorrhœa, he thought it might be a question whether the latter was not too often disregarded in the present

day, both in the diagnosis and the treatment of this disorder. Many of these constitutional causes, such as atmospheric changes, which induce either general catarrhal inflammations, plethora in some, anemia in others; everything which induces defective nutrition and debility, as prolonged lactation; excessive fatigue from certain employments; the continued standing position for many hours, were all so well understood causes that further reference to them was unnecessary. The influence of nerve disturbance as a consequence of defective nutrition was perhaps not so generally appreciated, although most practitioners knew the fact that, in some of their patients, strong mental emotion was sure to bring on troublesome leucorrhea. Although the anatomy and physiology of the organs of generation were well known, he suspected we might have overlooked the bearing which certain facts had on the affections under consideration. Mayrhofer had directed attention to the fact that, in virgins, the arteries of the uterus had a straight course, but during pregnancy they were turned spirally, and after confinement, they never recovered their straight direction. He suggests that this may account for the fact that disturbances in the uterine circulation which have the character of retardation, are more easily remedied in virgins than parous women. But the views are of much more importance in the question of the emptying of the circulation in the veins than in the arteries, because of their greater number and absence of valves.

Leucorrhea with its attendant symptoms is not at all rare in young unmarried ladies, and every year he saw many cases, chiefly from among those who came to the city "to finish their education," as it is termed. The moral depression from "home-sickness" and exhaustion of nerve-power exercised in accustomed directions seemed to him to be the most common of the constitutional causes in these cases. The routine prescription of some preparation of iron, under these circumstances, was sure to destroy appetite and produce headache, etc.

In very many cases in which leucorrhea and other uterine disorders had been the consequence of parturition, local treatment was useless, and even positively injurious, but a cure might be effected by appropriate constitutional treatment.

In women who have passed the climacteric period, leucorrhea is not an uncommon symptom. In the majority of such cases the disorder arises from constitutional causes, but, of course, rectocele, vesicocele, or malignant disease, etc., might give rise to it. If the leucorrhœal discharges are occasionally sanguinolent, an examination is absolutely imperative.

The paper being before the Society for discussion, DR. LYMAN, of Boston, remarked that he had long been convinced that such a paper as that just read by Dr. Barker would be of great service to the Society, as we were too much in the habit of giving up old views concerning constitutional causes of diseases, and trusting too much to local treatment. Cases, such as described by the author of the paper, were numerous, and must come into the

practice of every man, and the leucorrhœa could not be accounted for except by anemia or general relaxation of tissues, there being absolutely no local disturbance requiring anything more than cleansing local treatment.

DR. H. P. C. WILSON, of Baltimore, had been greatly interested in the paper read by Dr. Barker. Cases of leucorrhœa had been constantly under his care, sometimes occurring in girls overtaxed with brain labor, sometimes attended by indigestion, and sometimes accompanied by various other causes, and he had always regarded it as a symptom of some remote condition which required treatment. He thought that we had all become absorbed in the local treatment of leucorrhœa, and that we had forgotten the constitutional treatment which belongs to every such case, and, indeed, to every case in gynecology. The woman who has local uterine trouble gets into a demoralized state of mind more or less, and even after a retroverted or an anteverted uterus has been rectified, this influence continues for a long time, and her entire vital force is concentrated upon her genital organs. She goes for months and years together to a medical gentleman for local treatment, and very often when her mechanical trouble is removed she will not get well until something is done which requires an entire change in her mode of life.

DR. A. REEVES JACKSON, of Chicago, remarked that he found himself always surprised by the interest excited by old subjects when they were presented by those who can make them attractive. All of us had had cases of leucorrhœa which had been supposed to depend upon some local cause, and when that local cause had been removed the miserable symptom still remained. He had had these cases, and he had treated them topically by every means known to him, hoping that they were cured, but soon they came back, complaining of the leucorrhœa as at first. He had watched the condition of the bowels, but no benefit had followed even when constipation had been removed; he had corrected errors in digestion, and yet no improvement had followed so far as the leucorrhœa was concerned, and in very many of these cases he had been absolutely unable to remove the leucorrhœa. He had been very much interested in Dr. Barker's paper, but it was certainly true that all of our patients were not able to go to Long Branch, and perhaps not all of them were able to be treated with tincture of colombo, and that very frequently all constitutional measures seemed to be insufficient to remove the disorder, and indeed he thought it was impossible to completely cure some of these cases.

The sermon which Dr. Barker had given was as good as could be preached from the text, and personally he was grateful for having had the opportunity to hear the paper.

The discussion was closed by DR. BARKER who said that it was not his intention to in any way depreciate the importance of careful physical exploration, but simply to call attention to the fact that there are cases where, on account of peculiar circumstances, local treatment and local examination is not impossible or practicable or useful, and that in these cases particularly, as

well as in all others, constitutional measures might be resorted to with the greatest propriety and benefit.

Thursday—Second Day—Morning Session.

The Society was called to order at 10 A.M. by the President, and the first paper was read by J. KNOWSLEY THORNTON, M.B., C.M., of London, England, on the

RELATIVE VALUE OF HYSTERECTOMY AND OF THE COMPLETE REMOVAL OF THE UTERINE APPENDAGES FOR THE CURE OF UTERINE FIBROIDS.

Before proceeding with the paper proper, Mr. Thornton remarked that he included in the term "hysterectomy" all cases in which the uterine cavity was laid open, more or less of its wall being removed along with the fibroid. Whether one or both ovaries was also removed was not a matter of any consequence. He reserved the term "complete supra-vaginal hysterectomy" for cases in which the fibroids, the uterus, and the uterine appendages were all removed, and it was, therefore, a combination of the two operations which to-day were considered rivals.

Every one who devotes himself to gynecology knows that every year a large number of women either die as a result, directly or indirectly, of fibroid enlargement of the uterus. There are many, also, whose lives are in danger constantly from hemorrhages and other causes; and there are many more whose lives are rendered miserable on account of physical suffering, and they are so wretched and useless that they are justified in taking the risk of any operation. In this paper the author confined himself solely to those cases which can be best treated by abdominal section, if treated at all. He classified his cases as follows:—(1) Fibro-cyst of the uterus; (2) fibroid outgrowths from the uterus, pedunculated and sessile, both of which were outside of the field under consideration; (3) groups of outgrowths surrounding and involving the whole of the organ; (4) intramural fibroids; (5) submucous fibroids; (6) general fibroid enlargement of the whole or a greater part of the uterine wall.

He had collected cases belonging under these heads from the following operators: Sir Spencer Wells, 39 cases with 19 recoveries; Péan, 46 cases with 30 recoveries; Billroth, 25 cases with 10 recoveries; Thornton, 25 cases with 16 recoveries; Bantock, 21 cases with 15 recoveries; Koeberlé, 19 cases with 9 recoveries; Schroeder, 18 cases with 11 recoveries; Hegar and Kaltenbach, 12 cases with 11 recoveries; Savage, 9 cases with 6 recoveries; Thomas, 7 cases with 4 recoveries. Total, 221 cases with 131 recoveries and 90 deaths, which gives a mortality of over 40 per cent. In estimating the value of these statistics, which, of course, were imperfect, we must remember that these operations are usually performed under unfavorable circumstances. Should the statistics of ovariectomy be obtained under the same conditions, it is probable that the mortality would not be very much behind that which has already been given, for the mortality which Mr. Spen-

cer Wells has reported of all his cases, taking him as an example, is 31.09.

If now we turn attention to fibro-cyst of the uterus, of which Wells reports 8 cases with 5 recoveries and 3 deaths, Bantock 8 cases, 6 recoveries and 2 deaths, and Thornton 6 cases, making a total of 22 cases with 17 recoveries and 5 deaths, we have a percentage of mortality represented by 22.72. This is a disease which most closely resembles ovarian tumor, and most urgently calls for operation, and yet we find the mortality is only about one-half that of the mixed cases. Of the mixed cases, we find, of those reported by Mr. Wells, Bantock, and Thornton, 85 with 35 deaths, making a percentage of mortality represented by 40.70.

If we take now complete hysterectomies, we find that the mortality is still greater; so that we must conclude that in many of the operations only outgrowths within or without one or both ovaries were removed. The uterine cavity not being opened, we might then, at the present time, he thought, place the mortality of abdominal section as somewhere between 30 and 40 per cent, and that the mortality where the supra-vaginal portion of the uterus is removed, or the operation in which the uterine cavity is cut into is considerably higher than this. Although he felt sustained in the belief that surgical aid was justifiable, even necessary in a certain number of cases, yet there was this grievous mortality. These operations, notwithstanding the improvements in the performance of hysterectomy and complete supravaginal hysterectomy, remained very formidable; but thanks to American surgery, the brilliant conception of Blundell, in 1823, was made a recognized surgical procedure by Battey in 1874, and from the labor of others, he was able to present to the Society an operation perfected, which would render the formidable character of hysterectomy still less than it had been in the past. The complete removal of the uterine appendages, when efficiently performed, cured fibroids of the uterus with a rapidity and certainty that Blundell in his most sanguine moments never dreamed of. Statistics from Battey's tables and from Tait's, Savage's, and Thornton's tables were then given in support of this statement. Mr. Thornton then remarked that he was well aware that statistics could be made to prove anything; but yet he was of the opinion that the removal of uterine appendages was attended by less danger than the other operation for the removal of uterine fibroids. And the question arose, Were we justified in subjecting patients to supravaginal hysterectomy when we can cure them by removal of the uterine appendages? Some would inquire, Can we cure them by the latter operation? So far as his experience and his observation had led him, he was prepared to believe that the operation was a justifiable one, and that it should be performed in preference to supra-vaginal hysterectomy. Mr. Thornton then related briefly the history of eight cases in which he had performed the operation, and in these histories appeared the reasons for the operation, such as severe hemorrhage giving rise to extreme anemia, and accompanied with enlargement of the uterus and a

general vascular condition. In one patient the tumors were sub-peritoneal and intramural, and there was no hemorrhage; menstruation was regular. In one case there were severe hemorrhages and great pain, and both ovaries were very much enlarged; the uterus was well down in the pelvis, and had a soft boggy feel.

In only one case was there any fever after the operation was performed.

The remaining portion of the paper was devoted to a consideration of the selection of the cases, the method of operation, and the enumeration of special points to be attended to in its performance. He had reached the conclusion that it was of no use to simply remove the ovaries. It was still less useful to remove a part of the ovaries. The most important thing to be borne in mind concerning the operation was, that it should be performed thoroughly or it will fail. A most important point in the operation was to prevent hemorrhage by ligating the large vessels in the broad ligament. In order to tie them efficiently, the tubes and the ovaries should be thoroughly strangulated at their bases. Removal of the ovaries was necessary in order to check the rush of blood to the tumor. Either imperfect removal of the ovaries or imperfect ligature of the blood-vessels may cause failure of the operation. The operation may not entirely stop menstruation, but it does so in most cases. It is best to transfix deeply, and make the ligatures embrace all the tissues. No. 3 Chinese silk saturated in phenol solution, one to twenty, was sufficient, and the peritoneum should be thoroughly cleansed before cutting anything away. The operation should be performed before the tumor has attained any very great size. The operation is applicable to all enlargements or fibroids of the uterus, and also to fibro-cystic tumors of the uterus if provision be made for drainage of the latter during the shrinking and absorption of the solid tissues. Possibly further experience may show that this drainage is not necessary. He should in the future prefer this operation to enucleation for intramural or submucous tumors unless they were partly disposed of by thinning or necrosis of the mucous membrane. His faith in Listerism was well known, and this of all operations was one in which it should be held to. Although good results might be obtained without full antiseptic precautions, yet he did not think the best results can be obtained without a rigid adherence to Listerism.

In summing up, Mr. Thornton said that the operation of complete removal of the uterine appendages for fibroids and fibro-cystic tumors of the uterus was indicated in all cases where the surgeon's aid is required, and is the more conservative operation and less dangerous than that of supra-vaginal hysterectomy. The latter operation should be resorted to only when the former has been tried and failed.

DR. WM. GOODELL, of Philadelphia, remarked that there were only a few points in Mr. Thornton's most interesting paper in which he differed with its author, and upon those only slightly. He was present at one of the operations which Mr. Thornton per-

formed and in which he saw him do something that prompted him (Dr. G.) to repeat in a similar case, and which he (Dr. G.) feared was the cause of the patient's death. Mr. Thornton opened the cyst and there was a good deal of hemorrhage, part of which was arrested by ligatures, but the deeper bleeding was controlled by the introduction of perchloride of iron, which was speedily swept out, and the patient recovered. Dr. Goodell had an analogous case in which he did the same thing, except that he used Monsell's solution, and he was inclined to believe that death was caused by the iron.

Further he had performed extirpation of the ovaries successfully a large number of times, and certainly should prefer to perform that operation. But there are cases in which this cannot be done. He had performed oöphorectomy four times for fibroid tumor, with two recoveries and two deaths. Unfortunately all the operations were performed in a general hospital, and he fancied that in one case, at least, death was due to that fact. A brief history of these cases was then given. He thought it so desirable to remove both ovaries, that in the future whenever he performed ovariectomy and found fibroid of the womb, he should feel justified in removing both ovaries. On the contrary, hysterectomy was so fatal in this country that in the majority of cases he thought it was decidedly preferable to remove the ovaries; and yet there were cases in which the tumor was so immense that oöphorectomy could not be resorted to.

DR. T. G. THOMAS, of New York, said that his experience with regard to removal of the uterus for tumors, solid or fibrocystic, under the circumstances alluded to, had been confined to thirteen cases, of which there were seven recoveries and six deaths. In giving *seven* recoveries, he made a statement concerning one case, as follows: The patient was exceedingly exhausted by chronic diarrhea, and the operation was performed in the month of June. From the operation, the patient recovered so as to be able to sit up, and was quite comfortable; but *two* months afterwards, she died, apparently from the direct effects of chronic diarrhea which suddenly became increased in severity.

With regard to the propriety of these operations, he should say that he was a dangerous gynecologist who should go forth determined to extirpate the uterus for solid tumor, and he thought Mr. Thornton would agree with him in that statement. The reason why he would be dangerous is because solid fibroid tumor of the uterus is so common. Yet there are cases in which hysterectomy offers nearly the only hope of saving life. The idea was that hysterectomy should not be undertaken unless the life of the patient seemed to be in jeopardy on account of the existence of the tumor. If life is in danger, and the tumor can be removed by the vagina, that method should always be preferred. With regard to the method when hysterectomy is the operation to be performed, he had at last concluded upon the following: First tie the vessels in the ligaments about the ovaries, and remove them, tying those next to the uterus first. Then lift the tumor,

and if a stump could be obtained in that manner, secure it by a temporary ligature, and then cut the tumor down until two flaps are retained, which are united, the whole secured with a carbolized ligature, and return the pedicle to the abdominal cavity. If forced to do so, he uses Kœberlé's *serre-nœud*, closing the wound as thoroughly as possible around it, and sometimes introducing a drainage-tube. But the results of hysterectomy in this country are not good. Why they were not better, he did not know. Why they were better in Europe than in the United States he was unable to say.

There is another point, and it is that the operator should be careful with reference to performing oöphorectomy when the case has been treated with ergot previously. For there may be sloughing at the very heart of the tumor, and an operation performed under those circumstances would greatly endanger the patient's life. As the question now stands, he should, if he could get on with oöphorectomy, not feel warranted in exposing the woman to the more dangerous operation of hysterectomy.

The discussion was closed by MR. THORNTON, who said that he most thoroughly agreed with that which Dr. Thomas had stated concerning this operation for uterine tumors; it should be performed only under extreme circumstances, and it was for that reason he was particular in giving the conditions which justified it in the cases reported. He was quite prepared to hear Dr. Goodell's and Dr. Thomas's views with regard to enucleation, but must confess that he should hesitate before he would include such cases among those most suitable for hysterectomy. He was particularly struck by the remark made by Dr. Thomas concerning sloughing taking place in the centre of the tumor, when the ergot treatment had been previously adopted, as he had never seen a case of that kind. With regard to false menstruation, it had seemed to him that, where excessive loss of blood had occurred before, considerable loss of blood might be expected after the operation, and the opposite. With regard to removal of the second ovary, he agreed with Dr. Goodell, and should not again leave it. He thought the risk to life was so much less when the pedicle is brought upon the outside, that he should hardly agree with Dr. Thomas upon that point. In conclusion, Mr. Thornton thanked the Society for the honor it had done him in listening so attentively to his paper.

ANNUAL ADDRESS OF THE PRESIDENT.

The President, DR. THOMAS ADDIS EMMET, of New York, said it would seem to be in keeping to present in the annual address a digest of special medical progress, but on account of the existing facilities for rapid transmission of medical events, this might be deemed no longer necessary. The Society had received a hearty welcome from its Boston friends, and it might well congratulate itself upon this the seventh annual meeting that it bid as fair as at any previous one to bring forth good fruit. Death had exacted

from it but a single tribute since the last annual meeting, and it was his sad duty to announce officially the death of Dr. James P. White, of Buffalo, New York—one of the founders of the Society. After commenting upon the labors and character of Dr. White, the President proceeded to the following topic:

A NEW METHOD OF EXPLORATION, WITH THE PATHOLOGY AND TREATMENT OF CERTAIN LESIONS OF THE FEMALE URETHRA.

The general practitioner has yet gained but little knowledge of the diseases connected with the female urethra. In fact, it might be held that the subject remained to this day in as much obscurity with the profession at large, as existed concerning uterine diseases some forty years ago before the introduction of Sims' speculum. Certain persons attained dexterity in the use of instruments, and doubtless had been fairly successful in the treatment of this class of affections, but the existence of a profound degree of ignorance had been the rule, and consequently much damage had resulted from the frequent confounding of cause and effect. He had known several cases where the bladder had been injected with solutions of nitrate of silver, until finally cystitis was established. Many, as well as himself, had treated, without success, a supposed diseased condition of the bladder or urethra where the seat of irritation lay in an unsuspected inflammation about the folds of the utero-sacral ligaments. He himself had opened the bladder by making a vesico-vaginal fistula, had closed the opening when, as he supposed, the disease had been removed, but had been obliged to reopen the fistula, and finally found that the real disease was a urethral polypus which an expert in the use of the endoscope had failed to discover. The President did not believe that the various means which had heretofore been proposed for examining the urethral tract possessed very much practical value, even in the hands of those most experienced in their use, and he, therefore, passed immediately to the consideration of the method of exploration which formed the basis of his address.

It was some six years since he first devised a plan of making a button-hole opening into the female urethra for the purpose of making a diagnosis or to facilitate any operative procedure, but during the last two years he had gone over the subject very carefully, and the method which he was about to describe was the only one he believed within our knowledge which fulfils every indication, was safe, simple, within the scope of any one possessing the least degree of surgical dexterity. For its application it was necessary to anesthetize the patient, and place her upon the left side, using a moderate-sized Sims speculum to bring into view the vaginal surface covering the urethral tract. He had devised an instrument for making an opening into the urethra. It was formed somewhat upon the principle of the scissors used for cutting button-holes, with the exception that the portion entering the urethra was made rounded and like the extremity of a large uterine sound. The vaginal blade had a portion removed

as in the button-hole scissors, so as to begin the incision about one-fourth of an inch from the urethral orifice, and from which point the opening was to be extended in the median line nearly to the neck of the bladder. The instrument answered the purpose, but had not been perfected to his satisfaction. When the incision was made by means of the knife or scissors, the operation could be greatly facilitated by first introducing into the urethra a block-tin sound of sufficient size to put the tissues within the canal somewhat on the stretch. The operation was begun by catching up with the tenaculum all the tissues on the vaginal surface about midway between the mouth of the urethra and the neck of the bladder, and dividing them through to the sound. After this, the canal was entered, and the incision was extended with a pair of straight-pointed scissors in the median line backward toward the neck of the bladder and forward to within a third of an inch of the mouth of the urethra. It was necessary to avoid dividing the urethral outlet, and it was also still more important that the incision should not involve the neck of the bladder, as the patient would then continue to have control over the urine. He wished particularly to impress the importance of this precaution, not to extend the incision through the urethral surface too far backward. The line along the vaginal surface should be made nearly one-third longer than the one through the urethral mucous membrane, and it is important that the chief difference should be at the end of the line from the neck of the bladder. We thus gain with bevelled edges a great advantage for the examination of the urethral tract. Moreover, from the greater length of the line being on the vaginal surface, we see the lower angle of the incision at the neck of the bladder, so that if necessary the finger or a small speculum can be passed into the vesical cavity with little fear of laceration or loss of control. Should we wish, by operation, to make a simple exploration of the canal, we can after doing so unite the line of incision without delay, but to unite them properly the urethral edges must be turned by means of the tenaculum, so that the suture may be passed in a way to include the mucous membrane and bring its divided edges into close line of contact. The after-treatment is simple, and consists in keeping the patient in bed for a week until the sutures have been removed, and in being careful for a few days longer. While in bed, she should be allowed to empty the bladder at will, using the bed-pan when possible, and avoiding the passage of the catheter, except under the most urgent circumstances. When it is desirable to keep the opening patulous, the edges of the divided urethral mucous membrane may be united to the vaginal surface, by means of interrupted sutures of properly prepared catgut, or by simple silk thoroughly carbolized.

In the last edition of his work on gynecology, he classified, in a general way, the diseases of the urethra under the following heads: 1, inflammation of the mucous membrane, or urethritis; 2, pedunculated vascular and neuromatoid growths; 3, prolapsus of the mucous or submucous tissues; 4, fissures at the neck of the

bladder; 5, urethrocele; 6, lacerations of the urethra from dilatation. He regarded it as advisable to still adopt this classification, and the object of the paper was to supplement by a record of additional experience what he had already written, rather than to again go over the whole subject.

It was claimed that the advantages from the operation for exploration were greater than could be given by any other method known to the profession, inasmuch as the whole of the canal could be fully exposed, and any mode of treatment suggested by the condition of the parts could be easily applied; further, that the operation was perfectly safe and could be executed without difficulty; that if properly performed, control of the urine will not be in the slightest degree impaired, and that the bladder can be emptied afterward at will and without difficulty; that no difficulty has been experienced in closing the urethral opening afterward; that on inquiry, those who have been operated upon have said that after the edges had healed they were unable to appreciate any difference in the passage of the urine; that it is not intended to supersede vesico-vaginal fistula for cystitis or for the removal of stone in the bladder. This opening in the urethra cannot be of the slightest advantage for drainage of the bladder unless the urethral canal be also involved.

DR. FORDYCE BARKER, of New York, in behalf of Dr. Lusk who was unable to be present, referred to one case which had been under Dr. Lusk's care in Bellevue Hospital, and upon whom he had performed the operation just described by the President. So satisfactory was the result that he at once performed the operation upon another patient who had been in the hospital for three months and previous to her admission had been under treatment for a long time. The first night after the operation the woman slept well, and within a week was able to go out and resume her duties as a domestic. Since that time, and during the last summer Dr. Lusk had performed the operation twice and with the same success.

DR. A. J. C. SKENE, of Brooklyn, thought, with reference to treating a patient for cystitis when that disease did not exist, that the fact simply showed the practitioner to be of the inferior class; for, certainly there was no disease which could be diagnosticated more positively than cystitis.

With reference to diagnosing diseases of the urethra, with a single exception, and that was the one prominently brought forward by Dr. Emmet—namely, polypus or any neoplasm—he claimed that we have had means of diagnosis equally as accurate for all cases of laceration, ulceration, inflammation, fissure, etc., as that explained by the President. Before speaking of methods, there was one statement in the address which he wished to challenge—namely, that it is an easy operation, and any one possessing any degree of surgical dexterity can perform it. To that he could not agree, and the President should not forget that what to him might be perfectly easy, was for a very large number of men exceedingly difficult. Besides, he did not think that the op-

eration *was* one always easy of performance. Moreover, when the opening had been made, it did not by any means afford the most perfect method for diagnosis when compared with others, except in cases of polypus. Take for example fissure. Dr. Skene thought it was not one-half so easy to diagnosticate it by means of Dr. Emmet's operation as by the aid of the endoscope, and such was not a matter of theory, but was susceptible of demonstration.

The discussion was closed by DR. EMMET, who said that the paper was not one on the treatment of disease of the bladder, but on a method of exploring the urethra and facilitating the treatment of its diseases, and he did not know of any means so good. He was well aware how much the profession was indebted to Dr. Skene, but it must not be forgotten that he stood almost alone with his knowledge and skill, and it was equally well known that the knowledge of the profession at large was nothing like that which he (Dr. S.) possessed, nor could they always put their patients under his (Dr. S.) care. The method he (Dr. E.) proposed was for the general practitioner.

Second Day—Afternoon Session.

The Society was called to order by DR. G. H. LYMAN, of Boston. Vice-president.

The first paper was read by DR. T. GAILLARD THOMAS, of New York, and entitled,

NOTES OF TWENTY-ONE CASES OF EXTRAUTERINE PREGNANCY.

Until the last decade very little special attention has been paid to the clinical study of extrauterine pregnancy. In a general way it has received attention in works upon obstetrics, and the physiology and pathology of the subject had been carefully investigated, but its clinical bearings and collection of histories, and the careful collation and analysis of the symptoms which should arouse the fear and suspicion of the practitioner, and give the most appropriate treatment, had received an amount of attention entirely incommensurate with their paramount importance.

For the pathologist there were many varieties, but for the practitioner there are naturally but three, namely, tubal, interstitial, and abdominal. The history of the twenty-one cases which had fallen under his observation was then briefly given. The symptoms which most frequently led to diagnosis were the symptoms of normal pregnancy accompanied by (1), irregular gushes of blood ceasing and suddenly recurring without assignable cause; (2), fixed grinding pain in one iliac fossa, and perhaps down the corresponding thigh; (3), paroxysmal pains occurring with severity, marked by constitutional symptoms and in a short time passing off, to recur with increased violence in a few days; (4), symptoms of abortion without an appearance of the fetus; (5), expulsion of membranes without accompanying fetus.

The physical signs which sustained the validity of these symptoms were, 1st, increased size in the uterus and displacement of it upwards, forwards, or laterally; 2d, evidence of vacuity in it, yielded by the sound or tube; 3d, the presence either to one side of the uterus or behind it of a cystic tumor somewhat painful to the touch, rather immovable, giving to palpation a sense of rather obscure fluctuation, and in some cases yielding the sign of "ballottement." In a few of his cases this sign had been plainly distinguishable, but this had been an exception to the rule, and the absence of it should never be relied upon as evidence against the existence of the condition. In cases of advanced gestation of the ectopic variety, the placental murmur, the fetal heart, and the movements of the fetus will of course present themselves as valuable signs; but in tubal pregnancy, the kind most commonly encountered, death will very generally occur from rupture of the fetal nest before they become at all available.

As to treatment, he proposed simply to give rules which he thought his experience would induce him to adopt in the future.

First. If an ectopic tumor be discovered and its nature pretty well settled before the end of the fourth month of gestation, he would destroy the vitality of the child by electricity in preference to all other methods which have been proposed.

Second. Should the fourth month of gestation be passed and surgical interference be called for, laparotomy or, if the tumor be low down in the pelvic, elytrotomy should be preferred to the use of electricity, which leaves a large fetal body to undergo absorption inside the body of the mother.

Third. Should the pregnancy be abdominal, the practitioner might watchfully await the full term of gestation, and deliver, then, by laparotomy or by elytrotomy, combined with the forceps or manual delivery.

Fourth. Should full term be passed and the fetus be dead, the practitioner should wait and watch, if possible, until Nature demonstrates the outlet by which she desires the extrusion to effected, then she should be aided. If, on the other hand, bad symptoms under these circumstances, at any time, showed themselves, laparotomy, under strict antiseptic precautions, should be promptly resorted to.

Fifth. Should rupture of the fetal nidus have occurred before diagnosis has been fully made, the practitioner should wait and see whether Nature is powerful enough to overcome the shock and control hemorrhage, then, further, if the patient is going to escape the dangers of peritonitis and septicemia. If these favorable results do not occur, if hemorrhage is about to destroy the patient immediately, or if septicemia attacks her lately, laparotomy, followed by antiseptic cleansing, should be promptly adopted.

The next paper was read by DR. H. J. GARRIGUES, of New York, on

ELECTRICITY IN EXTRAUTERINE PREGNANCY.

Dr. Garrigues presented his paper with special reference to one point of treatment, and gave the history of a case which had come under his own observation. The case presented the usual clinical symptoms and physical signs. Ballottement could not be obtained. It was treated with electricity, a one-celled French apparatus being employed. The applications were made daily, and each sitting occupied ten minutes. Ten applications were made, when the tumor was positively reduced in size, and the patient seemed well. During the application of electricity, she had not been in bed a single day, but had gone out and been able to attend to the duties of her small household.

With reference to diagnosis, the author of the paper thought it no more difficult than in normal pregnancy.

With reference to treatment, he thought that electricity was perfectly safe as compared with other methods. There were differences of opinion with regard to the use of this agent in the early or later stages of the pregnancy, but he could not conceive of any objection to the destruction of the life of the child, if it became necessary in order to secure the safety of the mother.

Two objections have been raised against it: 1st, that it is not reliable; 2d, that it is apt to cause rupture of the cyst. The second is purely theoretical. With reference to the first, up to the middle of the fourth month it has been successful in every case in which it has been employed. The author of the paper discussed at length the symptoms and the physical signs, the different methods of procedure which had been advised in the treatment of these cases, the several points in differential diagnosis, and reached the following conclusions: That experience has proved electricity to be an efficacious and safe agent for arresting extrauterine pregnancy during the first three months, and perhaps in some cases where the pregnancy has even advanced more or less into the fourth month; that it seems likely that the same agent may be profitably used at any period of fetal life.

The discussion upon these two papers was opened by DR. H. F. CAMPBELL, of Augusta, Ga., who said that he had observed only a single case, and there was connected with it one remarkable fact—namely, that the child developed, and the woman went to full term before either mother or child died. At the autopsy, an extrauterine pregnancy of the tubo-ovarian variety was found with a full-grown fetus.

With reference to diagnosis, it should be borne in mind that all of the asserted symptoms of early pregnancy, presented by the condition of the breasts, were sometimes manifested from ovarian or uterine irritation, independent of pregnancy. He thought, therefore, that we could not always place absolute reliance upon these signs as evidence of either normal or extrauterine pregnancy.

DR. H. P. C. WILSON, of Baltimore, said that within the last two years he had been called to see two cases in which death sud-

denly occurred, with all the symptoms of rupture of the sac in extrauterine pregnancy. His own experience in connection with extrauterine pregnancy had been limited to two cases, one of which went to term. It was a twin pregnancy, and one of the children was delivered naturally, and the second child was delivered through an abdominal incision. The child delivered through the abdominal incision lived to be two years old, and then died of cholera infantum. His second case was one of early pregnancy. No ballottement could be obtained. After gestation had reached two and a half months, he used electricity, as had been suggested, except that he placed one pole upon the tumor in Douglas' cul-de-sac and the other above the pubes. This plan was kept up six or eight days, until the tumor was evidently diminished in size, and it finally disappeared, and the woman recovered, and was still living.

DR. GOODELL, of Philadelphia, remarked with reference to diagnosis that, if pregnancy occurred after a long cessation of fruitfulness, or after long-continued sterility, he should at once suspect that it was of the extrauterine variety. Another point was to distinguish extrauterine pregnancy from pregnancy in a retroflexed womb. Again, paroxysms of pain connected with pregnancy he regarded as evidence of extrauterine gestation; also, a pregnancy continued after a supposed abortion; also, aid in diagnosing extrauterine pregnancy could be obtained by the size of the tumor, as the cyst in extrauterine pregnancy is much smaller than the uterus would be at the corresponding time of uterine gestation. He then gave briefly the history of the thirteen cases which had fallen under his observation.

DR. A. H. SMITH, of Philadelphia, with reference to diagnosis referred to the thermometric test. In pregnancy the temperature of the cervical canal rises above the normal. Perhaps this test might be of some aid in arriving at a diagnosis.

Friday, Third Day, Morning Session.

DR. SAMUEL C. BUSEY, of Washington, D. C., read a paper on
THE INFLUENCE OF THE CONSTANT USE OF HIGH-HEELED FRENCH
SHOES UPON THE HEALTH AND FORM OF THE FEMALE, AND
UPON THE RELATION OF THE PELVIC ORGANS.

The foot and its coverings is not a new subject. Far more attention, however, had been given to the style and display of the covering than to the comfort and physical well-being of the foot. From this point the author of the paper gave a historical resumé of the different coverings for the feet which had been used as far back as the time of the ancient Egyptians. The heel at first was designed to make short men look tall, and like other parts had undergone many changes to suit the whims of fashion and taste. During the reign of Louis XVI. this objectionable style began to

disappear, but has been again revived, and is perhaps more general now than at any previous time. In the Seventeenth Century the heels were greatly modified, but with little regard to the physical well-being of the feet. The author presented at length the causes which had produced inequalities consequent upon fashions and customs, the variations in form of the types of the different races and families of the human race, deviations from these types or species and families that distinguish individuality, and the influence which all this had exercised upon the evolution of the typical and individual forms of the female sex. Age, pregnancy, and maternity were manifest and admitted agencies in the causation of deviations of the female form. Dr. Busey then gave Paget's description of a perfect female foot, namely, "great breadth and fulness of instep, a well-marked great toe, a long second toe projecting a little beyond the great toe, and a very small or in some cases almost suppressed little toe." The author of the paper then illustrated with diagrams the normal female foot and a malformed foot, directed especial attention to the change in the obliquity of the pelvis, and to the probable corresponding change in the position of the uterus and the pelvic organs, and then discussed the question, "How are these relations of the natural form influenced by excessive and constant elevation of the heels by the use of high-heeled shoes?" The primary deflection of the line of gravitation takes place at its base, and from this point there are greater or lesser deflections of the entire skeleton above. The vascular, postural, and nutritive disturbances growing out of such deflections of the skeleton might find their starting-point in too great and habitual elevation of the heel. Of these, the menstrual disturbances and vaginal discharges were the most common.

DR. FORDYCE BARKER, of New York, remarked that all must have been charmed with the literary style and excellence of the paper, and with regard to the scientific value, it seemed to be so complete that he could not add anything to it in that respect, but must accept every scientific statement made by the author of the paper. He had, however, a great many times in his life been struck with the fact that the practical results from the adoption of certain fashions and peculiarities of costume were quite different from what science teaches us they should be. There was no doubt that, from a purely scientific point of view, many of the fashions adopted not only in this country but abroad, give rise to most deleterious results, and he was glad that the paper which Dr. Busey had written had been presented to the Society. But it was also a fact well worthy of notice that whatever scientific conclusions might be reached with reference to the matter, their practical application would be almost if not absolutely impossible.

DR. T. G. THOMAS, of New York, agreed substantially in the opinions which had already been expressed by Dr. Barker. He thought the health of our women was greatly affected by occupation during youth and that the introduction of such games as lawn tennis which required out-door exercise and

freedom from restraint of dress had done more for the health of our women than could have been done by many volumes written upon the subject and fully indorsed by statements of physicians. He had been fully prepared to believe, from a scientific stand-point, the direct influence of high-heeled shoes upon the pelvic organs, but he had been disappointed with regard to the clinical facts whenever he had had opportunity to place such cases under observation.

The discussion was closed by DR. BUSEY, of Washington, who stated that he did not pretend that all the conclusions at which he had arrived were accurate, largely because of the inherent difficulty in the practical study of the subject. He exhibited several photographs which illustrated the difference in appearance of the human body, with and without high-heeled shoes, and the change in the angles and outlines of the body.

The next paper was read by DR. T. M. DRYSDALE, of Philadelphia, on

THE OVARIAN CORPUSCLE: ITS ORIGIN AND CHARACTERISTICS.

This paper was one promised in reply to the paper read by Dr. H. J. Garrigues at the last annual meeting of the Society. He summarized his statements with reference to the ovarian cell, as follows: First, that the cell called the ovarian granular corpuscle is almost invariably found in the fluid of ovarian cysts; second, that this cell may be distinguished from the pus-cell, lymph-corpuscle, white blood or other cells which resemble them, both by appearances of the cell and by its behavior with acetic acid; third, that it has been named the ovarian granular cell to distinguish it from all other cells found in abdominal dropsical fluids, not meaning to assert that a cell having a similar appearance may not be found in cysts met with in other parts of the body; fourth, that this cell, when found in this locality, he believed to be pathognomonic of ovarian disease: fifth, he claimed that the granular cell was discovered by himself in ovarian fluids, and differed in appearance and its behavior with acetic acid and ether from any other granular cell found in the abdominal cavity, and which, by means of these reagents, can be readily recognized as the cell which has been described. Further, that by the use of the microscope, assisted by these tests, we may distinguish the fluids removed from ovarian cysts from all other abdominal dropsical fluids. Sixth, that a full and accurate description of this cell has never been published to his knowledge, except by himself, nor any tests given by which to distinguish it from others which often closely resemble it. Dr. Drysdale then quoted Dr. Garrigues' assertions, as follows: First, that the bodies found in ovarian fluids, known as Drysdale's corpuscles, are not cells, but are only nuclei; second, that, in appearance, they are entirely like the pyoid bodies described by Lebert as early as 1846, and that the test given for them by Lebert is the same, that is, acetic acid; and further, that Lebert has shown that they can be

found in various parts of the body; third, that, in ovarian fluids, these bodies were first described in 1852 by John Hughes Bennett, with indications of the effect which acetic acid has upon them; fourth, that these bodies are not pathognomonic of ovarian nor any other cysts, as they may be found in various parts of the body. These points being stated, Dr. Drysdale proceeded to give his own views in regard to the origin and characteristics of the ovarian cell before replying to the remarks of Dr. Garrigues.

In examining the inner wall of the ovarian cyst, it will be found to have, like the Graafian follicle, from which it is derived, an epithelial lining. This lining surface secretes the contents of the cyst, and it is itself constantly undergoing growth and decay. The cell elements multiply, and are passed off *pari passu* with the increase of the cyst. A great number of epithelial cells do not come to maturity, but are thrown off before being completely developed, or, in other words, before a nucleus is formed in them. This rapid growth and shedding is, as usual in such cases, attended by a partial degeneration of the cells, giving them their granular appearance. Being immediately immersed in the albuminous fluid of the cyst, they acquire by maceration in it that delicacy and transparency so peculiar to them. This is the origin of the ovarian cell described by Dr. Drysdale, who then passed to the consideration of Dr. Garrigues' opinions with regard to the origin and nature of these bodies. The discussion was lengthy and necessarily technical, the results depending upon the action of the reagents and close microscopical observations, but his conclusions were that there was not a tittle of evidence to support the theory of Dr. Garrigues, but, on the other hand, the negative evidence against the truth of his assertions was overwhelming.

MR. THORNTON, of London, Eng., thought that Dr. Drysdale had, in his discussion with regard to the origin of the ovarian cell, entered a field in which at present the histologist and pathologist were "utterly at sea," as every writer on histology and pathology had a different opinion. It seemed to him that we have not, as yet, any settled basis upon which to stand, because so few agreed as to what a cell is and how it grows. Having expressed his lack of faith in our present knowledge thus far, he should differ, as a matter of course, somewhat with Dr. Drysdale in what he said concerning the growth of an ovarian cyst and the place for the formation of the cell. He had long since reached the conclusion that the nucleus, perhaps better to say the nucleolus, was the first and not the last element, and that the growth of the cell came afterwards. Of course that view struck at very much which Dr. Drysdale had said regarding the origin of his cell. Whether it should be called a cell or not, he had, long before Dr. Garrigues' paper was published, reached exactly the same conclusion—namely, that it was a nucleus of a rapidly degenerating cell of the cyst membrane.

But passing to the practical part of the question, when he first began to study the subject, he for some time was delighted with

his success in diagnosis; but then came failures, and finally they were so abundant that he ceased altogether to attach any special importance to the presence of these bodies. However, from Dr. Drysdale's positive statements he was willing to go back and renew his study of the subject.

DR. ENGELMANN, of St. Louis, expressed the opinion that Dr. Drysdale's cell possessed no special diagnostic importance, and the discussion was closed by DR. DRYSDALE, who stated that some of the best authorities in physiology agreed with him concerning the origin of the cell and of ovarian cysts. With regard to the cell being a nucleus, he would have so regarded it twenty years ago, and it was only after prolonged examination that he arrived at a different conclusion. He believed it to be an aborted epithelial cell.

Third Day—Afternoon Session.

DR. E. VAN DE WARKER, of Syracuse, read a paper on

THE MECHANICAL THERAPEUTICS OF VERSIONS AND FLEXIONS
OF THE UTERUS.

The mechanical therapeutics of uterine displacements is yet unsettled. No department in gynecology has been the object of greater interest, and no department of surgery in general has stimulated a greater inventive activity. But with all this invention, the mechanical problems involved are not advanced, nor the question of utility in any manner settled.

Do pessaries generally accomplish the purpose for which they employed? He had proposed the problem from its mechanical stand-point, and in this view of the subject it must be answered. His own opinion was that uncertainty resulted from (1) expecting too much from the use of the pessary, and (2) from selecting an improper agent for want of more clearly defined ideas upon the absolute limitations imposed upon the action of pessaries, and which must govern the results to be expected.

Given a flexed or verted uterus, the problem is to restore it mechanically to a position which approximates the normal; or if that is not possible, then to sufficient extent to relieve symptoms. Now, the normal position has never been and cannot be defined, simply because it is one of movement, not of stability.

The correction of a flexion or version of the uterus mechanically, with certainty, comfort, and safety to the patient, depends upon the following fixed conditions, which cannot be violated:—(1) The limits imposed by uterine mobility; (2) the limits imposed upon the action of pessaries by the vagina; (3) a pessary must be adjusted with proper regard for the safety of the pelvic soft parts; and (4) a pessary must be so adjusted as not in any way to retard or arrest the function of any pelvic organ, nerve, or vessel.

These were considered in order, and the text was illustrated

with several tracings taken by the mercurial manometer, showing the change in position of the uterus during respiration, forced respiration, coughing, talking, walking, etc. This was followed by a classification of version and flexion pessaries.

The paper was extensively illustrated, and contained a historical part.

The discussion was opened by DR. H. F. CAMPBELL, of Augusta, Ga., who said that the term "fitting a pessary" had always been repugnant to him; for, if the pessary was introduced so as to "fit," it certainly caused fixation which was in every sense an abnormal condition of the womb. The uterus should always be replaced before the introduction of a pessary. Remove the instrument at night. The real name for a pessary was a crutch to support too heavy a womb and a weakened state of the ligaments. He agreed with Dr. Van de Warker in the statement that there is no form of vaginal appliance that will ever straighten a flexed womb.

DR. H. P. C. WILSON, of Baltimore, had found that several trials might be necessary before a pessary was obtained that met the requirements of the case. There was no rule that could be followed absolutely in their use. The safe rule was that if the pessary was at all uncomfortable it was wrong.

DR. PAUL F. MUNDÉ, of New York, did not agree with Dr. Van De Warker, who believes that, normally, the uterus is ante-flexed.

DR. VAN DE WARKER.—Simply curved forward, not ante-flexed.

DR. MUNDÉ regarded the almost horizontal inclination of the uterus as shown by diagrams of Drs. Van de Warker, Schultze, and others to be an abnormal position. Having determined, as well as may be, the normal position, the question is, What shall we do, when the uterus is displaced forwards or backwards, to restore it? He thought that, as a rule, anterior displacements did not require mechanical treatment by means of intravaginal pessaries with or without abdominal support, unless there was combined with the displacement a certain amount of sinking of the uterus attended by dragging upon the uterine ligaments and pressure upon the bladder. In the cases in which there is sinking of the uterus, symptoms are developed and relief is afforded by the use of a support. But, after abundant experience, he was compelled to admit that, while ordinary uncomplicated cases of retroversion were easily treated by replacement and a proper pessary, no form of uterine displacement had given him more trouble than retroversion with impaction or adhesion of the fundus, or retroflexion of a soft flabby uterus. He would be happy to hear of any means by which such cases could be satisfactorily and permanently relieved.

The discussion was closed by DR. VAN DE WARKER, who said that the special design of his paper was to consider the pessary separated entirely from the pathology or etiology of uterine displacements, believing that the instrument should be studied as

was opium or castor-oil, independent of the pathological conditions in which these medicinal agents might be used.

The following officers were elected for the ensuing year:

President.—DR. GILMAN KIMBALL, of Lowell, Mass.

Vice-Presidents.—DR. A. H. SMITH, of Philadelphia, and DR. THEOPHILUS PARVIN, of Indianapolis.

Council.—DRS. JOHN BYRNE, of Brooklyn; W. T. HOWARD, of Baltimore; A. REEVES JACKSON, of Chicago, and H. F. CAMPBELL, of Augusta, Ga.

Secretary.—DR. FRANK P. FOSTER, of New York.

Treasurer.—DR. PAUL F. MUNDÉ, of New York.

New Members.—DR. MATTHEW D. MANN, of Buffalo, N. Y., and DR. W. H. BAKER, of Boston.

Honorary Members.—MR. J. KNOWSLEY THORNTON and MR. LAWSON TAIT, of England.

The next annual meeting will be held in Philadelphia, beginning on the third *Tuesday* in September, 1883.

DEPARTMENT OF DISEASES OF CHILDREN.

EDITED BY . . . GEORGE B. FOWLER, M.D.

ORIGINAL COMMUNICATIONS.

A CONTRIBUTION TO THE STUDY OF THE MANNER OF TRANSMISSION OF SYPHILIS IN UTERO.

BY

HUGO ENGEL, A.M., M.D.,

Fellow of the American Academy of Medicine, etc., etc., Philadelphia.

ACCIDENTAL occurrences, official positions, etc., induced me for some time to pay more than ordinary attention to the study of hereditary syphilis and subjects intimately connected with the same, as a number of my articles will prove, which, during the last few years, were published in the *Philadelphia Medical Times* and other journals. About a year ago the following interesting case came under my observation and had not a little influence on my opinion concerning the manner in which the syphilitic contagion may be transferred to the fetus.

J. H. B—, a German, æt. 29, came one day, full of excitement, into my office to ask my advice in the following matter. He had been married four years. His wife, whom I had delivered twice already of healthy children, both girls, was herself a splendid specimen of blooming womanhood. She had been on a visit to her mother, who lived at her country-seat in the neighborhood of Bethlehem, Pa. As the business of J. H. B— forbade his visiting his wife, who was again a little over two months *enceinte*, and as he was of a very amorous disposition, he had become unfaithful to his marriage vows about a week before his wife's return from the country, but at her arrival, had again resumed his duties as a husband. To his astonishment, he observed the next morning a small sore on his penis. A dreadful suspicion then brought him to me. He had undoubtedly had chancre. To hide the affair, I had to tell his wife that women

suffered frequently from sores in their sexual organs during pregnancy; that these, being apt to occur more after several deliveries, often gave rise to no symptoms, but that they, if not early attended to, might produce serious consequences. From the willingness with which the poor lady permitted an examination, if not from her character alone, I was convinced that she was innocent. Of course, I detected nothing, but said she had a slight sore, and acted as if I had touched it with a piece of sulphate of copper. B—— then induced, not without some difficulty, however, the woman he had had the unlucky connection with, to undergo an examination. The woman had a Hunterian chancre on the inside of the left labium minus, and an inguinal gland of the same side was enlarged. To follow up her or B——'s history would be of no further benefit here. Six days later, Mrs. B. sent for me, complaining of soreness. On the mucous membrane of the left labium majus was a small indurated sore. About six weeks later, a bubo followed, not suppurating. Two months later, she had psoriasis palmaris syphilitica and angina. To all appearances I succeeded in establishing a cure. At full term, she was delivered by me of a healthy male child, which, however, showed a copper-colored macular eruption near the anus. When a week old, snuffles developed themselves. These symptoms yielded rapidly to mercurial inunctions, followed by the internal administration of iodide of potassium. The child presents to-day no signs whatever of hereditary syphilis.

Here was a healthy woman and a healthy husband. The woman, after having given birth to two healthy children already, becomes again *enceinte*. Afterwards her husband contracts syphilis, infects his wife, and the fetus—fecundation having taken place when both parents were healthy—becomes infected in turn, and how? Undoubtedly through the blood of the mother.

Perhaps the most impartial statement of this question, based upon diligent study and careful investigations of facts, has been given us by Dr. E. Lesser.¹ *A propos* of the case just mentioned, it may be well to look at the literature of the subject, and to throw all possible light on the question before us. Certainly we can quote only the main representatives of the two conflicting opinions.

As well known, Kassowitz recognizes two kinds of transmission of diseases to the unborn fetus; 1st, by the semen, or ovum-cell, both parents sharing equal responsibility, *hereditary transmission* in the real meaning of the word, and 2d, transfer of the infectious material from the circulation of the mother to

¹ Breslauer aerzt. Zeitschrift, No. 12, 1882.

that of the fetus: *infectio intra uterum*. In syphilis, being a chronic infectious malady, both ways are possible, though Kassowitz is of a different opinion, contending that syphilis is transmitted to the fetus by hereditary transmission only. To divide this question, the same may be divided into two parts: *a*, can a non-syphilitic mother give birth to a syphilitic child? This question answered with yes would be proof for hereditary transmission. *b*, A mother acquiring syphilis while being *enceinte*, will she transmit the syphilis to her previously healthy fetus? The answer yes here would be a proof for *infectio intra uterum*, though the possibility of hereditary transmission would by no means be excluded.

Ad *b*, we may here mention that some authorities, while acknowledging the possibility of an *infectio intra uterum*, contend that such a one can only take place if the mother becomes contaminated during the first seven months of pregnancy.¹ We cannot believe this as a general statement, but for syphilis we find an easy explanation for this fact, which, from the record of cases, we do not doubt does happen. If a woman is attacked by a primary sore during her seventh month of pregnancy, the healing of this sore takes in women usually at least three weeks; within from two to six weeks after the initial ulcer, the infection travels as far as the inguinal glands, usually on the same side as the sore, and generally one only inflaming, and with the suppuration of which the syphilis is apt to die out in the individual. Should such, however, not happen, and general constitutional affection follow, this will never be the case before six weeks after the primary chancre has been healed, and we know of no case where it appeared earlier than from seven to eight weeks after the first appearance of the initial sore. Now, how can infection of the fetus happen under such circumstances? If infection shall take place in the mother, the seventh month of pregnancy would be the time most favorable for the escape of the fetus, as the latter will be born before the blood of the mother has become infected, and even primary infection of the fetus is not probable, as the initial chancre in the mother has healed by the time of the delivery. Any primary infection of the mother, therefore, during her seventh

¹ Vide Keyes, Bumstead (local edition), and this JOURNAL, April, 1881, pp. 509-512.

month of pregnancy will exclude almost for certain the possibility of the infection of the fetus, and the non-occurrence of the latter fact under such circumstances would by no means affect in any way the present argument. But, if the primary lesion is in time to infect the blood of the mother with the fetus still *in utero*, the fetus will hardly escape. There are cases of small-pox sufficient, where the mother, suffering from the disease in her eighth month of pregnancy, gave birth to a fetus affected with variola.

But to return to the views expressed by Kassowitz. Basing his opinion upon a very careful study of one hundred and nineteen syphilitic families, he comes to the following conclusions :

A healthy woman may give birth to a child, syphilitic from the father, and continue herself in good health, if not infected from the outside. As proof, he cites cases where women who had been delivered of syphilitic children, themselves continued uninfected, while the father had admitted their being syphilitic.

A child, both parents of which were healthy at the time of fecundation, is born healthy, even if the mother should acquire syphilis during her pregnancy. This would tend to prove that the syphilitic poison does neither go from the fetus to the mother, nor from the latter to the former, an idea very prevalent among gynecologists.

Concerning these hypotheses, we must be of a totally contrary opinion, and share the view held by Caspary:¹ that a woman who gave birth to a syphilitic child should herself not be infected, is undoubtedly wrong for the following reasons :

The cases of Kassowitz, as Lesser so well says, cannot be considered conclusive, as K. himself admits that an examination of the sexual organs had been made in the least number of the cases.

There are a number of cases on record where the syphilis of the mother, who showed no symptom of the disease, was made clear by an accidental occurrence. I have myself witnessed three, having in two cases even attended the infected physicians, where the latter, after having known the women for a considerable time, and having not the slightest suspicion

¹ Wiener med. Jahrbücher, 1875.

whatever of syphilis being present when they delivered them, had been infected through the delivery, notwithstanding the child when born showed at the time no symptoms of hereditary syphilis, but gave undeniable evidence of congenital lues being present, a week or two later. From whence came the syphilis in these cases? The most that can be said is, that frequently the blood of a woman, whose husband has been syphilitic, will become syphilitic also, and sufficient to infect her child as well, as other persons coming in intimate contact with her, but the syphilis does not show itself in the woman by any appreciable symptoms or signs. Yet that obscure syphilitic symptoms in such women are by no means rare, we ourselves have had occasion to note. We have more than once attended the wife of a syphilitic husband, when the former would complain of obscure pains in the joints, muscles, bones, or nerves, generally worse in the afternoons and evenings, and seen these pains as well as other irregular symptoms, giddiness for instance, disappear like magic under the administration of iodide of potassium in large doses. We must remember that the syphilis of the husband, at a time he communicates the disease to his wife, is mostly one altered by medical treatment already, and giving rise, therefore, to a very mild form of syphilis in the wife.

Another objection to be raised against Kassowitz's view is the fact, of which we also have seen several instances, that a syphilitic husband, when he has connection with other women, causes frequently the breaking out of sores in the latter. Certainly we mean a man whose syphilis has been altered by medicine. He undoubtedly affected his wife first also, but the primary sores healed of themselves, and she, ascribing them to cohabitation, to her then still new, asks no physician's advise. But women who allow more than one man to have connection with them, are generally very cautious, and examine their sexual parts carefully. The wife later becomes *syphilis-proof*. But we have known such women in whom there existed no symptom or sign of syphilitic affection, to give syphilis to other men who had intercourse with them. These two varieties of cases would, by Kassowitz, not knowing more about the women than what he saw, and not being aware of the disastrous consequences a coitus with them brought about, as

women free from syphilis. As an almost conclusive proof of what we say, we will give the short history of a case we had under our charge during the centennial year, and which gave us at the time a great deal to think.

A boarding-house proprietress had a husband who, before his marriage, had been attended by me for secondary lues. They had one child, the congenital syphilis of which had easily been cured. Her husband never had any more symptoms. Two wealthy foreigners, who both earnestly assured me that they never had been affected with any venereal disease, had connection with this woman, which proved to them rather expensive. She not only swindled them out of a great deal of money, but they contracted multiple chancres, which, under mercurial prophylactic treatment, happily did not cause constitutional affection. A letter I received about a year later from them informed me of their continued good health. Threatening the woman with exposure, she permitted an examination. There was not a single abrasion anywhere of the mucous membrane of the sexual parts.

A perhaps still stronger proof against the first conclusion of Kassowitz is one mentioned by Caspary, the so-called Colles' law, according to which syphilitic infants, who do not infect their own mother, will, however, infect wet-nurses, a fact the truth of which has been certified to by a large number of cases on record. One already infected, as the mother is in such cases, will not be infected again.

With regard to the last objection made by us, we wish to refer to an observation, first made by Hutchinson, who says that, in a mother of a syphilitic fetus, a change of tissue takes place, which makes an impression upon the mother in a similar manner, guarding her against syphilitic infection in a similar way as a person vaccinated is protected from variola. The question is only, if the syphilitic impregnation takes place in consequence of this tissue-change, or is due to the frequent connections with a husband suffering from a change in the blood caused by syphilis altered by medical treatment.

One thing is certain, that it is more than doubtful that a mother having given birth to a syphilitic child is herself free from the syphilitic poison. This may be milder in her, may exist in an altered form, but still it exists. There are too many

cases in favor of this view, while one of the cases cited here or by Lesser or Caspary, is sufficient to upset Kassowitz's theory.

We come now to the hypothesis of Kassowitz that, if a fetus whose parents were healthy at the time of fecundation, is still in the uterus while the mother, during pregnancy, becomes affected with constitutional syphilis, not, therefore, with a primary sore only during the last two months, when not sufficient time has elapsed for the poison to enter the circulation of the mother, that such a fetus would be born healthy.

The case first reported at the commencement of this paper disproves this theory. There could not have been a healthier father or mother living at the time of fecundation than in that case. The husband then contracted syphilis, and transmitting it to the mother, the child born suffered from hereditary syphilis, mild in character, because the mother had been carefully treated. The very success of the treatment proves conclusively the intimate transmission of any altered state of the blood of the mother to the fetus, because it is well known that a syphilitic mother—*i. e.*, suffering from constitutional lues, not from the primary sore only—if so during pregnancy, and uninfluenced by specific treatment, cannot give birth to a living child.

But there are other cases which Lesser mentions, and by which he also disproves the second hypothesis of Kassowitz, that on a healthy fetus the blood of the mother, having become syphilitic during the pregnancy, had no influence.

There can be no doubt that the syphilitic poison is a fixed contagium (Lesser) which attaches itself to cells, and perhaps to the white globules, entering them in a manner similar to the bacilli of tuberculosis. If, now, white blood-corpuscles can pass through the walls separating mother from fetus, why should such subtle poison not do so? We know that many drugs in solution are carried through the blood of the mother to the fetus; small-pox affecting the mother will also attack the fetus, and Caspary even succeeded, after he had injected an emulsion of red sulphuret of mercury into the jugular vein of a pregnant rabbit, in finding numerous particles of the red cinabar (Zinnober, G.) in the fetal blood. Then we have the observa-

tion of Spitz,¹ who was able to demonstrate in the blood of a fetus the same spirilla which had caused relapsing fever in the mother. But more than that, Violet² mentions a case of Merit which is similar to our own, where a married woman, while pregnant, contracted syphilis from another man, and the child born was syphilitic.

Lesser reports a case, which we find described by Zeissl,³ and which comes still nearer to our own case. We will give in a few words its main points.

A husband became infected while his wife was pregnant in the second month; he infected his wife, who presented in her seventh month a primary ulcer in the small labium, and later a macular exanthem. At full term, she gave birth to an apparently healthy child, which, however, on the eleventh day, suffered from pemphigus syphiliticus in the palms of the hands and on the soles of the feet.

This case is the more important as the form of the exanthem is characteristic and, as Lesser says, diagnostic of congenital syphilis.

Here a woman became infected after, or, rather, in her seventh month; but the poison entering the circulation before delivery, the fetus became infected also, and there not having been time sufficient for the necessary specific treatment, the child presented one of the worst forms of hereditary lues. Can anybody, under such circumstances, and with such proofs before him, doubt the possibility of *infectio intra uterum*?

There are, however, still other similar cases, which have been reported by Vajda,⁴ Behrend,⁵ and others, so that there can be no doubt that the syphilitic poison may pass from the mother to the previously healthy fetus. While lecturing on this subject, students frequently told me of cases which had come to their personal knowledge in the practice of their preceptors, giving me occasionally full details of such cases.

According to the statistics before us, the literature on the subject, and our own observations, I think we are entitled to the following conclusions:

¹ Diss., Breslau, 1879.

² Etude pratique de la Syphil. inf., 1874, pp. 38, 50, and 51.

³ Allg. Wien. Med. Ztsch., 1879. No. 11.

⁴ Wien. Med. Wochenschrft., 1880, No. 30 et seq.

⁵ Berl. Klin. Wochschrft., 1881.

If the father is syphilitic, and has not been properly treated, his wife, as well as the fetus, will be infected through him, the wife giving visible evidences, and the fetus either still-born or soon dying; mostly, however, abortion brings to the world a dead, rotten, and skinless fetus.

If the mother at the time of fecundation is suffering from syphilis, and is during her pregnancy not treated properly, she will not give birth to a living child, until, perhaps, after several abortions.

If the father had been syphilitic, but treated properly, so that at the time of fecundation he showed no symptoms of the disease, the fetus may be born healthy, a congenital form later in the child developed will easily be cured, and the mother will be affected by an obscure form of syphilitic diathesis with almost no symptom, but she will be liable to cause syphilis in any other man with whom she may have connection. All these occurrences will be the more favorable the longer a time has elapsed since the cure of the disease in the father, and of the children of such parents, each following will show less the effect of the dyscrasia than its predecessor. Lastly, these occurrences will be the most favorable if the disease in the father had been radically and systematically treated, as we will mention further down.

If the father or the mother was syphilitic at the time of fecundation, and if the mother is subjected during her pregnancy to a systematic treatment with mercury, the fetus will thrive under the same conditions as when the father had been cured of the syphilis before the fecundation in a healthy mother, and the same conditions as then, regarding time, etc., hold good here; the earlier the treatment and the more thorough, the greater the effect.

A mother bearing a healthy fetus, but becoming syphilitic during pregnancy, will transmit the disease to the fetus, the latter, however, evincing a greater vitality than if the disease had been transmitted at fecundation or within the first few days of its existence. Treatment has here a similar influence as in the other cases.

A syphilitic child will not infect its own mother by nursing, but will do so to any unsyphilitic wet-nurse.

If a healthy woman, married to an apparently healthy hus-

band, both being young, aborts without any apparent cause, in nine cases out of ten this tendency to abortion may be cured and the woman made to carry the fetus to full term, by subjecting her, as well as the husband, to antisyphilitic treatment, especially, however, the husband, who, even if he denies his guilt, is usually at fault.

As regards the real cause of lues, there can hardly be any doubt that it will be found to consist in some kind of bacillus.

Syphilis is a chronic infectious disease with all the elements of other zymotic and contagious maladies. But the more chronic such a complaint, the smaller seem to be the bacteria that cause it, and the more difficult seems it to be to recognize them. Some years ago, I thought I had once succeeded in finding them, but I must leave the successful investigation to others more familiar with such examinations. I wish here only to suggest the following: A small-particle should be cut out of of the indurated tissue of a hard chancre, the same should be done with an indurated inguinal gland of the same kind, and with a syphilitic patch of the mucous membrane. These should be prepared in the usual manner, and subjected to different coloring processes; and I believe that iodine, not strong enough to destroy such bacteria, if present they are, will answer this purpose in connection with an aniline color. One part of the luetic material of the three kinds mentioned should be placed on a pure culturing soil, and the endeavor be made by the pure culturing process of Koch to propagate and to isolate the luetic bacilli. Counter experiments with such bacteria, inoculating animals with them, would afterward soon decide their true character. It is well known that all these bacteria die when brought in contact with mercurial preparations, and especially with corrosive sublimate, which is especially fatal to all micrococci and other low micro-organisms. For over fifteen years, German physicians recommended the administration of a very large dose of calomel in typhoid fever at its commencement, and insisted that they were able to cut short, in this way, the disease, while its later use rather did harm than good. Klebs' investigations of the bacilli typhosi have now given a scientific explanation to this fact.

But this little transgression, mentioned only on account of the analogy in the effect of mercury, brings me to another

point, the treatment of congenital syphilis. Certainly, I speak here only of the treatment of the children themselves; the treatment of father and mother, the latter during pregnancy and during gestation, evidently belonging to another department.

And here I will say that the older I get, and the more syphilitic children come under my charge, that of all treatments, the one which is also most successful in adults, the old one with mercurial inunctions, I still consider the best. According to the age of the child, from the first day of its life to its fourth or fifth year, the common mercurial ointment is used, its irritating character being made milder by the addition of unguentum petrolei, the more of the latter being added the younger the child. The treatment is the more rapidly effective also the younger the child, which easily can be explained by the greater power of absorption residing in the skin of young infants. I further never rub the salve directly into the skin, but always on the belly-band, which I make older children wear for this very purpose. The state of the mucous membrane of the buccal cavity being well watched and kept in a good condition by brushing or rinsing it with a moderately strong solution of chloride of potassium (not chlorate, usually, but wrongly, applied for this purpose), from five to twenty-five grains of the undiluted ointment, to which from one hundred to twenty-five per cent of cosmoline are added, are daily rubbed upon the same belly-band, the latter not being changed during the whole course, but the abdomen being cleaned before each application with a little Castile soap and tepid water, and then carefully dried. These inunctions are continued till every symptom and sign of hereditary syphilis has disappeared. I have yet to see the first case in a young child of mercurial stomatitis, though I can well perceive how a reckless application may cause even grave injury of that character. This treatment is then usually followed by a course of small doses of iodide of potassium internally, and this latter part of the treatment, for a few years, repeated every spring and autumn. I have seen the happiest results from this procedure, and shall in a few months be able to note the result in the third generation. Twenty years ago, I attended a gentleman for a rather severe case of lues; I cured him; he married, and,

among other children, his first, a girl, is now seventeen years old, married, and will soon have a child of her own. I never, since the first time in him, had again occasion to treat any member of the family for syphilis.

Occasionally when the symptoms are very mild in an infant, I adopt Niemeyer's advice, and give the child one-eighth of a grain of calomel twice or three times daily, and also with success. But such cases must be very mild; if the treatment has to be at all long continued, nausea and vomiting will soon forbid its further employment.

Should congenital lues develop itself later, at the time of the second dentition, or at the age of puberty, then iodide of potassium is the sovereign remedy, especially in affections of the bone, while diseases of the nervous system yield sooner and better to a combination, viz., to Donavan's solution, the number of drops being regulated according to the age of the child.

ORTHOPEDIC DEFORMITIES OF EARLY CHILDHOOD.

BY

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New York.

PAPER NO. II.

Continued from Page 718, Vol. XV.

Inversion of the Feet.

THIS condition may be either local or general. Local inversion is limited to the foot, and is not dependent upon malpositions of the knee or hip joints. It is associated with and caused by a weakened condition of the external supports of the ankle; the patient pointing the toes inward and turning the foot under, thus walking upon the outside of the sole (Fig. 1).

In walking, the gait is often a shuffle, due to the fact that the anterior portion of the foot is not well lifted from the ground, the muscular power being deficient.

The treatment consists in augmenting the power of the mus-

cles by electricity, rubbing, etc., and providing a proper apparatus to keep the foot in its normal relations with the leg without restricting the natural motions of the ankle, which are flexion, extension, and lateral movement.

It is conceded by all authorities that flexion and extension of the foot are both performed by the ankle-joint; but the movements of inversion and eversion are variously assigned to the astragalo-calcaneoid and mediotarsal articulations, it being asserted with positiveness that the ankle-joint, being a true hinge-joint, is thereby rendered incapable of any lateral movement

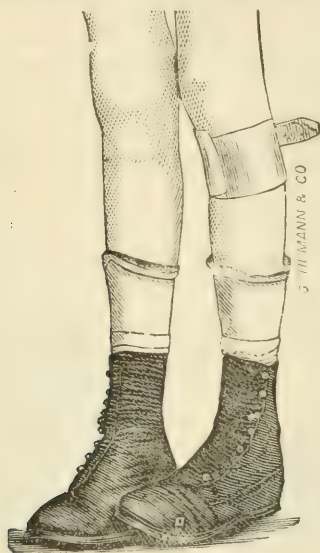


FIG. 1.

whatever. And yet that it does, to a limited extent, take place in this joint is apparent if the supports of the joint are allowed to relax, and the weight of the body is removed.

Let the reader cross one leg over the opposite thigh so that the foot becomes perfectly relaxed. Now, define the sides of the astragalus and os calcis under the malleoli with finger and thumb of one hand, and with the other grasp the foot, and roll it under freely. The astragalus will be felt to move just under the internal malleolus, and by the exercise of a little force the foot, as a whole, can be turned under almost to a right angle with the leg, the astragalus seeming to project almost to a level

with the internal malleolus; while a depression can be felt under the external malleolus. This rolling of the foot upon its horizontal axis, with inversion, seems to take place partly in the ankle, partly in the astragalo-calcaneoid articulation, and secondarily in the articulation of the head of the fibula with the tibia.

Lateral movement cannot take place in the ankle, however, unless the joint be relaxed externally; but when this is done, the hinge character of the joint is destroyed, and it is converted into a *movable* joint by the release of the outer surfaces of the articulation from contact with each other, thus allowing an extent of motion which is entirely impossible if the pressure be so sustained that the joint cannot be relaxed in its outer portion.

When, from undue muscular power, a misstep or other accident, the ankle becomes suddenly turned under while supporting the weight of the body, the surfaces of the outer part of the articulation become suddenly separated; while those of the inner part are jammed abnormally together. The joint is then rendered temporarily incapable of sustaining such weight, and grave injuries to the articulation are apt to result; the most frequent being common sprained ankle, and one of the lesions of which is the wrench sustained by the peronei muscles, one of whose functions seems to be to brace the foot at such an angle as to allow it to receive the weight of the body in a comfortable or advantageous position; this weight and the muscular power together locking it firmly in position until it is again relaxed or unlocked by being lifted from the ground, the weight of the foot then acting to relax the joint.

The prevailing opinion, that lateral motion in the ankle-joint is impossible, is partially correct since it does not take place in the *locked* condition of the joint, but in the *unlocked* condition, when the foot is rolled under, it would seem that lateral movement is not only possible, but that it actually takes place in the joint to a limited extent every time a step is taken, and the foot lifted and set down in position to receive the weight of the body to the best advantage.

All braces which are applied at the ankle should, therefore, be either pivoted at the side or beneath the foot, or be of suf-

ficiently flexible material to allow a normal amount of lateral motion ; otherwise they embarrass the proper movement of the foot.

The plan of treatment to be pursued in most cases of local inversion, after the physician is satisfied by thorough examination of the entire limb that the deformity is purely local, is to afford support, and at the same time, by spring power, to endeavor to bring the foot around to its normal position without restricting motion. This is accomplished in either of two ways : In the first, a jointed outside steel strip is used, attached to the bottom of the shoe by a pivot in the "centre of motion" of the

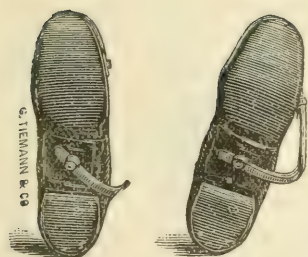


FIG. 2.

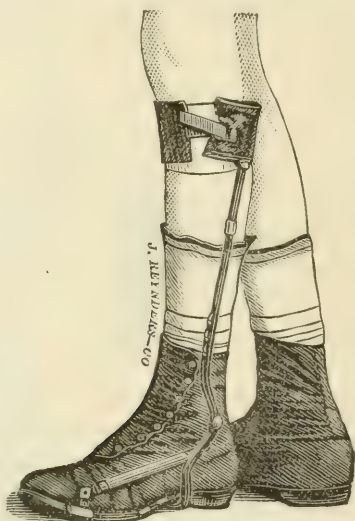


FIG. 3.

foot, thus allowing lateral motion (Fig. 2), and attached to the leg just below the knee by a girth (Fig. 3), which *must* be prevented from slipping by a strip of moleskin adhesive plaster buttoned over the girth, or drawn through the buckle, and thus fastened securely. A rubber cord or coiled spring of varying strength is now added, which passes from the strip to the outside of the shoe near the toe (Fig. 3). This cord should not be connected at both ends until the girth is firmly fastened to the limb, as otherwise the girth will rotate.

To prevent the foot turning under at the ankle, the steel strip is given an outward inclination where it passes under the shoe,

which converts it into a spring when the brace is buckled to the limb, effectually preventing the joint from giving way externally.

A simpler method of treating inversion, and one which possesses many advantages for general use, is the *twisted spring* (Fig. 4). It consists of a flat steel strip, jointed at the ankle, placed outside the leg only, and extends from a girth below the knee to the bottom of the shoe, where it is attached adjustably. This would merely afford support, were it not bent outward at the point where it passes under the shoe, thus effectually supporting the ankle. In addition, however, that part of the strip extending from the ankle to the girth is *twisted* out-

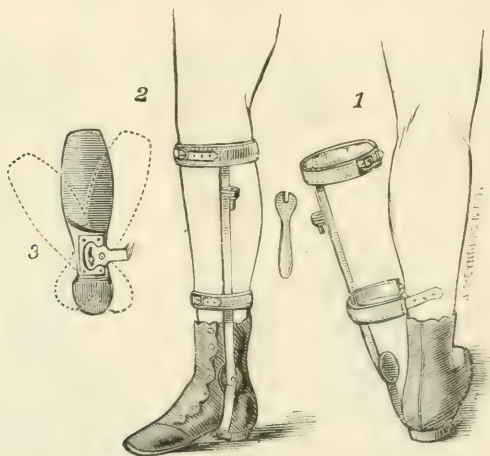


FIG. 4.

ward, thus producing an everting spring, which throws the foot outward when the girth is fastened around the leg. This everting power will be constant, and its form may be regulated by a clamp opposite the tibio-fibular articulation.

This brace also affords the support which is necessary in many of these cases, especially when due to paralysis, and as it rarely needs adhesive plaster, is extremely light and easy of application and removal. For children it is especially advantageous. While the brace is worn, the muscles should be vigorously stimulated by the means at our command, in order to hasten cure; but the use of a proper brace to assist the development of the muscles is the most important element of the

treatment. I do not limit myself, or should I recommend the reader to limit himself, to these braces alone; but as they are applicable to perhaps a larger number of cases than some others, they are detailed at length. Yet it will be found that certain special cases, which space forbids us to dwell upon here, will need the employment of special mechanisms.

General inversion of a limb (see Fig. 5), or, as it is more commonly called, rotation, is very often met with, either alone, or



FIG. 5.

combined with bowlegs, knock-knee, muscular insufficiency, and various deformities and conditions of joints.

Dr. De Forest Willard, who has bestowed much attention upon this subject, states that "this condition and its opposite, eversion, so rarely occur without some co-existent deformity, that a careful search should be instituted to detect the probable cause for such misplacement. If there be disease at the pelvis or hip, the inversion is ordinarily due to a rotation at the hip-joint; if knock-knee exists, the rotation will be partially at the knee, partially at the ankle; and the same is true in bowlegs.

If there is impairment of power in the thigh or leg muscles, then the inversion or eversion will be in accordance with such deficiency.

The inversion, in case of knock-knee, is probably due to the fact that, the knees being brought close together, the feet are widely separated; consequently, in walking, this too wide base of support is sought to be narrowed by bringing the toes nearer together.

Let any one attempt to walk with his knees and feet in the position of knock-knee, and he will fully appreciate the truth of this statement. With the toes turned outward, progression is exceedingly difficult, but with the toes turned inward, the feet can be easily carried forward by a swinging motion, in which the vastus externus and the peroneals seem to play an important part. When associated with knock-knee and allied deformities, the treatment of the inversion should be considered secondary to the treatment of the deformity; but it will be found that each yield more readily to treatment which is directed to the relief of both at the same time."

Dr. Bradford considers that "abnormal inversion of the foot is due to either a weakness of the external rotators of the thigh, permitting an inversion of the whole limb, a relaxed condition of the ligaments of the knee, or, more commonly, a weakness of the peronei muscles, which are overpowered by the tibiales muscles." In infantile paralysis, he considers this "to be most marked, but the same tendency will be seen to a slighter degree in non-paralytic cases."

There is one point upon which too little thought is usually given in the treatment of such deformities as we are now considering, and that is the thorough examination of the genital organs. Inquire of the parents or nurse whether the child has the habit of rubbing or playing with its genitals, and this you will find to be very often the case. If, on examination, you discover any abnormal cause for such genital irritation, as phimosis, adherent prepuce, or clitoris, this should be relieved before mechanical treatment is attempted, as, in some cases, it will obviate the necessity for such treatment.

Too much credit cannot be given by the profession to Prof. L. A. Sayre for the prominence which he has given to this subject of genital irritation as an element in the causation and

continuance of these abnormal conditions of the lower limbs, and the pertinacity with which he sustains his position.

There exists much difference of opinion in the profession at the present time in regard to the actual value of the operations upon the genitals in these deformities; but when a man of large experience in this domain of surgery is confirmed in his opinion in regard to their usefulness, it is of itself sufficient to insure the subject a fair trial as time elapses; and some of the cases noticed have so thoroughly borne out his statements that I cannot withhold my indorsement as to the value he places upon the subject.

Some of the successful results in cases I have seen are marked, and some cases of failure which have come under my observation seem to have been due to errors of judgment as to the degree of importance which the irritation bore to the extent of the deformity. In some cases, instead of being the cause of the deformity, it is merely a co-existing trouble without direct relation to it; and, of course, in such the operative procedures for the relief of the irritation possess no curative power over the deformity whatever. It appeals to the common sense that when an abnormal irritation of these parts exists, measures should be immediately taken for its removal; for, while the operations can do no possible harm, they are productive of cleanliness and other good results to the patients, and in many cases are of permanent benefit to the co-existent deformity. As to the exact benefit to be derived in each individual case, that can only be determined by actual procedure, although an approximate opinion may be given from the history and general conditions of the case.

I have in mind, among others, a case of double inversion, caused by infantile paralysis occurring in a female child, which had steadily resisted all treatment until, in consultation with Dr. Geo. F. Shrady, we decided to examine the clitoris, after eliciting the fact that the patient was continually rubbing herself; and we found it hypertrophied, engorged, and bound down by adhesions to the surrounding parts, the forcible rupture of which, under an anesthetic, was followed by prompt improvement, and conjoined with mechanical means, by the recovery of the patient.

The following extract from a letter from Dr. Geo. K. Smith,

of Brooklyn, will be found of practical value in this connection, and it is therefore inserted here :

Wm. McC——, age four years, colored (see Fig. 6), came under my care in the summer of 1879.

The photograph shows the feet inverted to such an extent that he walked on the outer border, and, to a slight degree, on the dorsum of each foot. The legs bowed outward. On examination, I found the opening in the foreskin so small that it could not be drawn back over the glans, and the prepuce was adherent. Behind the glans was a quantity of smegma, which could be felt by slight pressure with the thumb and finger. I ventured the opinion that the malformation of the limbs and the malposition of the feet were caused by irritation at the extremity of the penis. I further stated to the father that I believed that if the operation

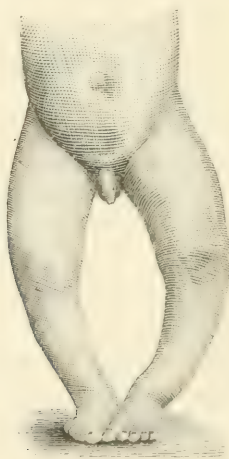


FIG. 6.

of circumcision were performed, the limbs, which were now bending beneath their burden, would become stronger, and that nature would straighten them without the aid of the costly apparatus used by surgeons to accomplish the same result.

I performed the operation, and in a few months it was plainly perceptible that the limbs were becoming straighter, and at the end of a year the improvement in this direction was but little less than marvellous. About this time, the boy and his mother were sent to live with friends out of the city, and I did not see him again. Eight months ago, the father told me one limb was entirely natural, and the other nearly straight.

After the presence or absence of genital irritation is determined, and, if present, relieved, the question of mechanical treatment of the inversion arises.

There are three classes of braces which may be used in the treatment of general inversion of a limb : rigid force, adjustable force, and spring force. Rigid force is produced by a metal bar attached to the shoe, and extending along the limb to a pelvic band, with appropriate girths and joints between, and, in some cases, accomplishes good results. An instrument of this class is described by Dr. Bradford, of Boston, as a pair of steel rods jointed at the knee and ankle, fastened into the

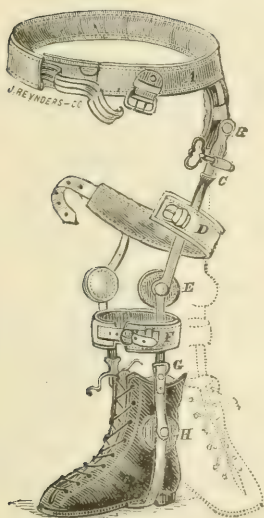


FIG. 7.

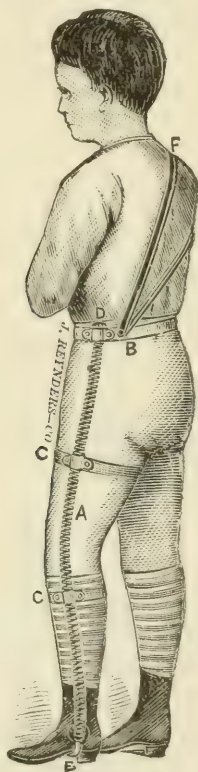


FIG. 8.

sole of the shoe, and passing on the outer side of the legs, reaching as high as the hips. At the hips, the rods are bent at the top, so as to pass behind the buttock, and incorporated in a strap which girdles the hip. If the top portions are properly bent, he considers it impossible, when the pieces on the two sides are fastened together behind, for either

foot to turn in, as it is held out by the outward rotation of the opposite limb. I have never tried this instrument, but should think it would make an excellent hip rotator, especially if the ends of the two rods be fastened together behind the buttock with a piece of elastic or spring.

Adjustable force is produced by the addition of a ratchet or ratchets to the foregoing, so that the vertical axes of the attachment girths may be placed in different planes at the will of the surgeon, thus effecting rotation when the attachments are fastened about the limb. As a representative of this class may be mentioned Sayre's rotating screw, depicted in Fig. 7; and in instances where it has been desired to rotate the limb at the hip, I have used this with satisfactory results. This instrument might be much improved by the addition of a ratchet just below the knee, and also below the foot, thus providing for rotation of the foot and leg, as well as the rotation of the entire limb at the hip, which it now accomplishes.

Spring force is the most generally advantageous power used in the treatment of inversion, because of its lightness and effectiveness, and the spiral spring seems to be the most efficient form.

So far as I am aware, there are but two forms of spiral spring to effect a rotation of an inverted limb.

First, the *coiled spiral* of Dr. Gregory Doyle, and second, the *twisted spiral* of the writer.

The action of both is that of constant coaxing, the muscles being assisted without being supplanted, or, more correctly, the bony framework of the limb is kept in proper position, so that the muscles may act normally. They are both light and comfortable, and easily managed. There is one feature of the writer's apparatus which Doyle's does not possess, and that is, support; for the former is an articulated, continuous, steel strip, which strengthens the limb as well as rotates it.

Dr. Doyle's rotator consists in a coiled spiral spring extending along the outside of the leg from a pelvic band, or corset, to the shoe, held in position by girths about the thigh and leg (Fig. 8). If these girths be fixed, the constant tendency of the spring to uncoil itself turns the thigh on the pelvis, the leg on the thigh, and the foot on the leg; and, as the instrument is exceedingly flexible, it is very nicely adapted to young chil-

dren and others when support of the limb is not required. But in so many cases of inversion, the articulations of the limb are so lax that some support is also desired, and for such cases an instrument consisting of a flat steel strip (Fig. 9), extending along the outside of the limb, from the shoe to the hip, articulated at ankle and knee, and provided with suitable girths, may be employed. This strip is twisted outward (thus forming a spiral) between the ankle and calf girths, thus (the foot being turned outward at the pivot beneath the shoe) turning the leg on the thigh. The strip is also twisted outward between the thigh

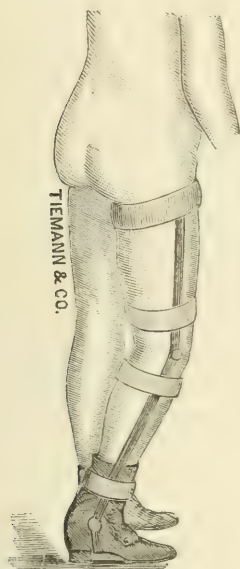


FIG. 9.

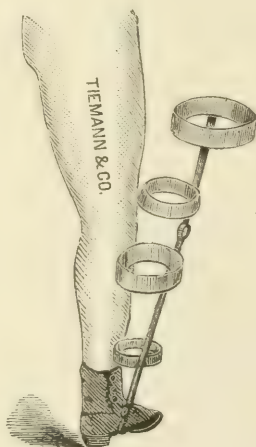


FIG. 10.

girths, thus forming a spiral which rotates the thigh on the pelvis without the necessity of a pelvic band (see Figs. 9 and 10). The amount of rotation can be regulated at will by means of small clamps connected with the two twisted spirals.

There can be no given rule for the employment of any of these instruments, nor would every case be equally well treated by any special one. The well-balanced surgeon who has in mind the principles governing the cure of such deformities, adapts and adopts certain instruments to produce given results in certain cases, and it is a mistake for one to confine himself to any one

plan of treatment. Certain instruments are preferable to others, which, in their turn, possess special advantages in still other cases, and it depends entirely upon the judgment of the practitioner, his knowledge of surgical mechanics, and his skill in adaptation, whether he shall obtain a more prompt cure than his neighbor.

The braces should be removed often (at least twice daily) for the thorough rubbing, kneading, and, if possible, electrical treatment of the deficient muscles.

INCONTINENCE OF FECES IN CHILDREN.

BY

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THIS is an affection which I do not remember having seen mentioned in our current literature, and a rather careful search among standard authorities has, with one exception, failed to reveal any reference to it. Henoch incidentally alludes to such a disorder when speaking of its analogue, enuresis.¹

The following two cases have, within three years, fallen under my care:

No. 1.—H., aged seven years, a boy of mushroom growth and hot-house culture. Began before breakfast every day with an hour at Spanish, and until 3 P.M. was unceasingly occupied with French, German, music, and the ordinary school curriculum. This policy, initiated four years before, the pressure being gradually increased, had been maintained almost without interruption.

The child had consequently developed into a sort of loaded phonograph, capable of startling automatic expressions which afforded much entertainment to visitors, and gave the ambitious father great hope and comfort. Under such conditions it is not to be wondered at that something gave way, and, fortunately for the brain, it was the sphincter ani.

When this deplorable occurrence first took place, the child was sharply reprimanded; but, the accident repeating itself, in the beginning two or three times weekly, and later about once a

¹ Lectures on Dis. of Children, p. 258, Wood's Library, 1882.

day, more pronounced measures were instituted to counteract the tendency. He was severely flogged on many occasions, deprived of liberty, luxuries, etc.; yet without avail.

The father finally gave me a history of the boy, such as I have just related, and asked me to see him.

I failed to find any spinal lesion, and the rectum was, to digital exploration, perfectly normal. The sphincter was tight, grasped the finger with the usual firmness, and there were no sources of irritation about the anus.

The abnormal conditions under which the child had been living very naturally, at the outset, suggested themselves as the cause of the difficulty, and I therefore advised a cessation of the punishments and a release from books. Besides, I gave ten drops Squibb's fl. ex. ergot three times a day.

The result was satisfactory in about three weeks, the involuntary discharges becoming gradually less frequent, and finally ceasing altogether.

No. 2.—A gentleman residing in a suburban village requested me to visit his daughter, who was affected with a most disgusting disorder. She was thirteen years old, but apparently had never appreciated the fact that she was out of the nurse's care, and beyond the protecting influence of diapers. From the period when she should have respected herself in such matters until the present, there was scarcely a day but that she did befoul herself. When remonstrated with, she would be deeply affected, and declare her inability either to explain or avoid the accident. Varied had been the treatment, and various the physicians who had prescribed. Electricity had been faithfully applied, generally and locally.

I found a tall, slim girl with a pale, expressionless countenance. The flesh was cool and flabby, the sclerotics pearly white, and her motions were listless. Examination of the sphincter and gave unmistakable evidence of relaxation of its fibres. For, although to a casual observer the anal outlet was sufficiently closed, to the practised touch there was an absence of resistance easily distinguishable. All else about these parts was normal. Altogether, then, we had a typical case of anemia. But, the parents informed me this had been the general verdict; yet iron, in none of its forms, had proved beneficial.

I prescribed a mixture containing fl. ex. ergot, ℥ xv.; tr. belladonna, ℥ v.; strychnia, gr. $\frac{1}{100}$ as a dose three times a day. At the end of a week she had had only two recurrences of her trouble, and within three weeks I considered her cured. She was then put upon citrate of iron and quinine, with marked benefit. About four months afterwards, all treatment having been long ago suspended, her father came and told me that the patient had, within a week, lost her appetite, was looking ill, and had suffered from her old difficulty once or twice. Wished to know whether he should repeat the former treatment. Asked, however, that the ergot be given in some other form, as the child had

taken a great dislike to it. Thereupon, I made a suppository consisting of ergotin, gr. v., cocoa butter, gr. x., and directed one such to be pushed within the sphincter night and morning; ordered to return to the iron and quinine mixture. Decided improvement was immediately manifest, and after a fortnight the bowel was under normal control. The suppositories were discontinued after the second week, but the tonic was persevered with for a month. There has never been any return of the difficulty.

These cases are peculiarly interesting with respect to their etiology, pathology, and therapeutics; and, to rightly consider them, we must recall the physiological anatomy of the parts affected.

The organs immediately concerned in normal defecation are, on the one hand, the sigmoid portion of the colon, the rectum, sphincter ani, and levator ani muscles; on the other, the spinal cord; directly through branches from the sacral plexus, and, indirectly, through its sympathetic branches. In the healthy state we have the sphincter muscle in a condition of involuntary tonic spasm, relaxed only to allow an alvine evacuation. It is generally considered that the rectum is empty until within a few moments before the final discharge takes place, and that it is only in cases where the intestinal contents are more or less fluid, or where the individual is habitually constipated or aged, that this portion of the bowel serves as a reservoir. Rectal accumulations, however, do not induce a normal desire for stool. They give us a feeling of weight and discomfort, and a sense of helplessness until artificial means are resorted to. Those accustomed to vaginal examinations are well aware how frequently this canal is occluded by a loaded rectum, and how oblivious the patient generally is to such an accumulation. It is at the sigmoid flexure of the colon, then, that the mass to be voided is temporarily stored, and from which the alarm is first given. The familiar sensation is conveyed from the mucous membrane through filaments of the hypogastric plexus of sympathetic nerves in a roundabout, gentle, and deliberate manner to the cord, and thence to the brain. In the mean time the colon is driving forwards its contents, and very soon the mass comes down to the sphincter, which, the time and place being convenient, and there being no distracting surroundings, relaxes, the levator ani muscles pulling upwards and outwards, and the act of defecation is accomplished.

The relaxation of the sphincter is due partly to spinal reflex, and partly to voluntary influence. It is capable of taking place, however, independent of any mental intervention, as is shown in animals and men after destruction of the cord above the lumbar portion. Under such conditions the sphincter acts as in health, except with the modifying and restraining influences of the will.

The centre for the sphincter ani is in the lower portion of the lumbar spinal cord, and is in communication with the striated sphincter muscle by means of branches from the fourth sacral and pudic nerve. These nerves being cut, the sphincter becomes permanently relaxed. Through these nerves the spinal centre endows the muscle with a constant, unconscious, unfatiguing tone. When the influence of this centre is withheld, or "inhibited," from whatever cause, we shall have a relaxed sphincter. The known agencies thus affecting the centre are, physiologically, irritation of the internal surface of the sphincter and emotional shocks.¹

Pathologically we may have this influence weakened, or wholly abolished, by degenerative disease of either of the three factors concerned: the spinal centre, the efferent nerves, or the muscle itself. On the other hand, there may be an uncontrollable, yielding sphincter from either excessive irritability of the cord, or hypersensibility of the lining membrane of the lower bowel or sphincter.

Now, with such facts before me, and remembering, also, that in children these reflex centres are prone to exalted sensibility, I concluded that the first case was one due to excessive irritability of the cord and, for some reason, this special sphincter centre. The nervous system of the boy had always received the maximum of culture, and his brain certainly was over-stimulated. The spinal cord is apt to sympathize with the brain, and I thought it fair, in face of the symptoms, to so consider it in this instance. The general muscular system, thanks to remarkably robust parents, and the sphincter ani in particular, was vigorous.

¹ External irritation of the anus, or sphincter, induces increased contraction, but the stimulus thus applied travels up the bowel, causing it to contract. Hence the evacuative effect of inserting the finger, or other resisting substances, through the muscle.

In the second case, we had, at first sight, a flaccid girl whose muscles were almost incapable of a normal reflex action. By actual examination her sphincter was found to be loose; in the same condition, in fact, as the rest of her muscular system. In the one case, then, we had localized excessive nutrition, in the other general lack of it.

I gave ergot in the first case, because of its well-known contractile effects upon the vessels of the cord; and in the second instance, for its established value as a restorative of contractile power to muscle. The belladonna and strychnia were added as synergists, and, as the result with the suppositories show, might have been omitted.

Henoch thinks that electricity in enuresis acts, not locally upon the sphincter vesicæ, but, like other painful and impressive measures, only psychically, and attributes his favorable results, from the hypodermic injection of ergotin near the anus, as due to mental influences. Electricity faithfully administered by a competent physician failed in my second case, but the painless and impressionless insertion of cocoa butter and ergotin cured the disease. I certainly think it was through the specific action of the drug. Ergot will almost certainly cure incontinence of urine, and given in excess will induce retention on account of rigidity of the sphincter vesicæ (Bartholow). According to my experience, its action is the same in a debilitated sphincter ani.

A CASE OF DIFFUSE CONGENITAL KERATOMA (ICHTHYOSIS CONGENITA).

BY

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ON May 20th, 1882, at the Nursery and Child's Hospital, Bridget O'Brien, æt. twenty-four, primipara, was instrumentally delivered in fifteen minutes, after being thirty-six hours in the first stage, of a female child that had presented in the first position of the vertex. During delivery the mother suffered laceration

of the cervix, and an extensive rupture of the perineum. The child was at, or very near, term, weighing 3,564 grammes (seven pounds and two ounces). The placenta, which was healthy, showing no fatty or other change, followed in ten minutes, and weighed six hundred and ninety-two grammes (one pound and six ounces). Then there was a slight hemorrhage before the uterus became well contracted. The child was covered with an hypertrophied epidermis, which, at first, was mistaken for dried vernix caseosa, and which had separated in plates from the true skin. It was of a dirty, light-yellow color, in strong contrast to the bright crimson of the congested skin. The child at first seemed dead, but in a few minutes began to breathe, and after an hour began to cry feebly. It passed meconium by the bowels and also vomited it. It died, after six hours, of internal congestion due to the malformation of the skin.

The mother's previous history was, that she had always enjoyed good health, never having suffered from any skin disease or syphilis, and the father was said to be a healthy, strong man, free from the above disorders. The labor was a hard one, due to the entire lack of lubrication, and after the delivery had caused the damage to the maternal soft parts mentioned, the case was considered serious and treated from the start accordingly. On the evening of the day of delivery the temperature rose to 102.5° with a pulse of 120 and respiration 28. The next morning, May 22d, the temperature, after a slight remittance during the night, rose to 103° with a pulse of 140. At the same time there was a natural lochia, and less tenderness of the abdomen and tympanites than on the previous evening; appetite good. The general condition, from this time until the afternoon of the 24th, seemed to improve, and all seemed to be going on as it should, the temperature having fallen to 100° and the pulse to 100. But this afternoon at six o'clock the temperature rose to 101.5° with a pulse of 104, and at 11.30 P.M. she vomited for the first time. At 6 A.M., May 25th, the temperature had risen to 103.25° ; but at 1 P.M. it had fallen to 100° , only to rise again at 6 P.M. to 102° , with diarrhea, offensive lochia, nausea, etc. On the morning of the 26th, at 5 A.M. the temperature was 102.75° , pulse, 108. The next morning, May 27th, it had fallen to 100.25° , to rise again at 2 P.M., to 102.25° , with a rapid weak pulse of 140, retaining nothing on the stomach; bathed in a cold perspiration, and died about 5 P.M. on the seventh day after confinement. No autopsy could be obtained.

The child was photographed, and twelve hours after death the autopsy was made with the following result:

Externally it presented the appearance of having been covered, at some period during its fetal life, by a perfectly smooth layer of a very much thickened epidermis, which had not increased in proportion to the child, and therefore was broken up by many cracks and fissures, as the increased size of the child stretched this inelastic layer. The movements of the child in utero and the difficulty of extraction had caused many of these plates to be separated from the true skin, exposing it to view. The fissures showed

something like a symmetrical arrangement. On either side there was more or less of a complete fissure from the axilla to the ilium, and there was a median division on the back and front of the chest. The abdomen and lumbar regions did not show any regular arrangement, but the arms and legs will be seen to be symmetrical in this respect. The position of the child was that of a fetus in utero, as shown in Figs. 1 and 2. The umbilical cord was normal, but whether the plates extended up it or not, I could not determine, as they had all been separated during birth.

The head was covered by irregular plates, bounded by fissures passing in an antero-posterior direction. One commenced a little to the left of the median line, at the border of the anterior fontanelle, passing backwards to break up in large and small fissures in the posterior parietal region. To the right of the median line a somewhat similar fissure passed in a corresponding direction, and ended in a similar manner. These fissures left between them a

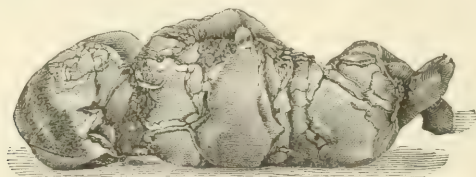


FIG. 1.—Back view of child.

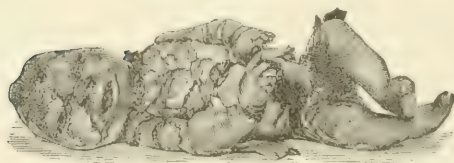


FIG. 2.—Front view of child.

large plate 5 mm. in thickness, which covered the anterior fontanelle. This plate had an elevated, smooth, central portion bounded by a shelving margin, which was striated, the striae radiating from the central thick portion. The plate gradually thinned out towards the margins until it was no thicker than the normal epidermis, these often being two to three centimetres in breadth and in its thinnest portions allowing the bright crimson derma to be seen underneath. (This will answer as a description for any of the plates.) It was this particular plate that caused great difficulty in making out the presentation. The posterior part of the head, from ear to ear, was covered by a continuous plate which, in its lower portion was cracked, fissured, and separated from the neck, when it was very much thinned, exposing the congested skin. This separation was undoubtedly due to the act of parturition. This plate also covered the parietal regions, and was covered with fine, dark-brown hair over most of its surface above the line of the ears, as

shown in Fig. 1. The diameters of the head were, occipito-frontal, 11.5 cm.; bi-parietal, 9 cm.; occipito-mental, 12.75 cm.; left oblique, 10.5 cm.; right-oblique, 11 cm. The face was oval in form, due to the puffed-out condition of the cheeks, having a transverse diameter of 10 cm., and a fronto-mental of 7 cm. The forehead, on the right side, was covered by a plate extending from the eyelid up to the superior border of the frontal bone, and over the bridge of the nose to the left, where it gradually thinned out, exposing the red skin; the right side was only partially covered by small fibrillated scales, and directly over the eye the bright crimson skin was completely exposed.

The nose was much depressed at the bridge, and the nostrils were flattened, but open; being covered with very thick epidermis which passed a short way up over the mucous membrane. The columna was also covered by this same epidermis. The eyes seemed to be represented by puffy, red, granular-looking tumors, which were composed of the turned-out and inflamed conjunctiva, caused by the retracted and unyielding condition of the eyelids. The upper lids were more affected than the lower, the right eye more than the left, for this latter had no plate on the superior lid, although it looked as if it had been lost during birth. The eyelashes were developed on both lids. The eyebrows were wanting. The eyeballs were normally developed and healthy.

The ears could be traced in their general outline, yet (Fig. 1) but very little resemblance remained to a normal ear, as the whole of the auricle was filled and more or less attached to the head by the hypertrophied epidermis, which here had a papillary appearance, particularly in the concha which it completely filled, thus wholly obstructing the external auditory canal. Their size, as far as one could judge, was normal.

The cheeks were puffed out and seemed thickened; the left one was covered with a large thick plate, the right only with small, irregular, fibrillated scales, which extended to the mouth and formed a radiating zone around it and over the lips down to their vermilion border, Fig. 2. The mouth was much more gaping than it should have been, with the lips very much everted, exposing the mucous membrane. They seemed thickened and were held in their abnormal position by the thickened skin. The tongue was normally formed, seemed large, and protruded slightly. The gums were normal, and there were no congenital teeth. The hard and soft palate was normal. The chin was receding, covered by small fissured plates down to the throat; there the plates became larger and appeared as those already described. The fissures on the face often exposed the bright, crimson skin beneath, and it was also exposed by the loss of several plates. The neck was for the most part free from scales, they having been detached during parturition.

The chest was covered with moderately large plates and fissures of irregular size and arrangement; but the thinning was mostly towards the axillæ and the median line. There was no trace of a nipple, and the crimson skin here and there showed through.

The axillæ were covered by small plates of the same character as those over the ears. The right shoulder was covered by a caplike plate, smooth all over, continuous with those on the neck, and ending in an abrupt manner in a circular fissure just above the insertion of the deltoid; the left shoulder was covered with seven small scales. The breadth across the shoulders was 13 cm.

The arms, 9.5 cm. long, were covered with irregular small plates anteriorly; posteriorly, there was on both arms a large rectangular plate reaching from shoulder to elbow, and half encircling the arm. The fissures were on the external and internal aspects, with irregular circular cracks at elbow and shoulder. The forearms, 8 cm. long, were covered by one large plate that reached from the circular cracks at the elbow to the wrist, and showed the thinning only on the internal side. Where it exposed the true skin, it was 4 mm. thick in its thickest part, the circular cracks on the arms marking the joints extended only to the skin, and were of a different nature from the fissures. The plates did not shelve off towards them, but were as if broken through or split up, as shown well in Fig. 2, at the wrist and knee. The distance from the fissure at the wrist to the ridge that seemed to indicate the metacarpophalangeal articulation was 3.5 cm. on both sides, and the fingers themselves only showed to the extent of about 1.5 cm. The hands varied in their development only in the fingers. They were covered with epidermis 5 mm. thick, without any fissures or cracks, which was strongly convex on the palmar side, and looked as if there might be fluid under it, but, on section, it showed nothing but a small layer of fat under the derma. The dorsum was only slightly swollen. The hands were 3 cm. thick. The fingers of the left hand were strongly flexed on the palm, and the thumb sharply bent at a right angle at the first joint. The fingers were straight and conical, having nails 1.5 to 2 mm. in length, but each phalanx was spindle-shaped, bounded by a circular crack at each joint. On the second phalanx of the first finger was a scale that stuck up like a nail, and looked as if it were the hardened epidermis that covered the first cells that formed the bed of the nail, and when the fingers grew it had curled up and remained on the phalanx above. The right hand showed the thumb as well developed as the left, only it was not bent, but the other fingers were flexed, were much shorter and thicker, and exhibited more a spindle-shape. They did not show the cracks at the joints. The nails were present, but not so well developed as on the left hand, that on the little finger being very rudimentary. They all showed the nail-like scales on the second phalanx. Both upper extremities were folded across the chest with semi-flexed forearm, and the hands in extreme extension, so that the fingers stuck up like birds' claws, and were nearly as hard and sharp.

The back, in the scapular region, as shown in Fig. 1, was covered by two large plates, the right one being 48 mm. in diameter, the left, 30 mm., while the thinned edges which surrounded them were from 15 to 20 mm. in breadth, and did not expose the true

skin. One of these fissures commenced at the neck in the median line, and passed down to the upper dorsal region, where it separated into two branches to pass forward and join the lateral fissures near the mammary line on the abdomen. These lines bounded the largest plate on the body. On its upper side this plate was 11.5 cm. vertically and 20 cm. transversely, not counting the thinned edges, which added 10 cm. to its transverse diameter, as it reached nearly around the body. Below this plate, over the lumbar region, was a zone 5 cm. wide, covered by irregular plates and fissures, eight in number. The buttocks were covered by one large plate of an irregular triangular shape, with its base upward and the apex breaking up into fine plates and fissures in the anal region, exposing the crimson skin. The fissure that bounded this plate laterally ran over to the groins, where they became thickened bands that passed down and joined in the middle line over the pubes, then separating, passed over and included the labia majora, joined again over the perineum, and ended in radial scales near the red and protruding anus.

The abdomen was mostly denuded of its plates when I saw the case, they having been lost during birth, so that the bright crimson skin was exposed over most of its extent. We found some of the plates which belonged there. They were rather small, about the size of those over the scapular, with thinned borders. They were seven in number, the largest being from the epigastric region, and was the one used to make the microscopical drawings. The vulva was formed naturally. The hymen was thick, with a central opening. The labia majora were also thickened; the labia minora were normal; the urethra was pervious. The clitoris was not to be found, being covered and obliterated by the keratoma.

The lower extremities were in a semi-flexed position, the right leg being crossed over the left, tailor fashion, and requiring considerable force to move them. The thighs, 10.5 cm. long, were covered continuously anteriorly by plates which ended at the knees; posteriorly these plates thinned off, and the space left between their edges was more or less covered by small scales. The crimson skin was considerably exposed. These plates were from 3 to 5 mm. thick. The right knee had the plates split, as shown in Fig. 2, but the derma was not exposed here, nor on the left knee. The legs were 9 cm. long, and covered by one large plate each, which showed a thinned portion posteriorly, exposing the derma. These plates ended at the ankles by circular cracks. The feet were 6 cm. long, conical in form, as shown in Figs. 1 and 2, and puffy-looking, somewhat like the palms of the hands; the keratoma showed no fissures on the feet or toes; it was here on the feet 5 to 5.5 mm. thick. The toes were 6 to 7 mm. long, and seemed rudimentary, like those of a fetus of five to six months; the big toe was separated from the others in a peculiar manner, as shown in Fig. 2. When I examined the bones of the feet, I found them normally developed for a child at term. The nails were much less developed than those of the hand.

On opening the abdomen, 60 to 100 grms. of a reddish fluid escaped, accompanied by some clots. There were no signs of peritonitis. The thorax did not contain any fluid; the lungs were only partially expanded. Microscopically they showed, in the expanded parts, that the epithelium was normal both in the bronchi and air-cells. There were three kinds of changes found: first, small regions of fetal atelectasis, particularly just beneath the pleura; second, regions where large numbers of air-cells were ruptured. This was particularly well marked in the apex. Third, small areas of expanded air-cells filled with red blood-globules. There was a large number of round bacteria present.

The heart was normally formed; the foramen ovale and ductus arteriosus were pervious. There were some small sub-pericardial ecchymotic spots along the auriculo-ventricular ring. The liver was of normal size and shape, was much congested, and microscopically showed that a marked fatty degeneration of the cells had taken place. The blood-vessels were very full of blood, and, in places, it seemed as if they had been ruptured, and had allowed the blood to escape. The bile ducts were normal. Here, as in the lungs, large numbers of round bacteria were found.

The esophagus, stomach, and intestines were normal, the latter full of meconium, and showing under its peritoneal coat a number of small ecchymotic spots.

The capsule of the kidneys was not adherent. These organs showed, on section, marked congestion, but the microscope revealed no organic change. The supra-renal capsules were congested merely. The spleen was very much congested like the other organs, and the microscopical sections showed areas 0.5 mm. square of red blood-cells. The splenic substance and cells were normal. There were here also a large number of bacteria. The uterus was 39 mm. long, the body being 15 mm. and the neck 24 mm. [The approximative normal measurements for a new-born child are: total length, 28 mm.; body, 12 mm.; neck, 16 mm.] The thickness of the body and neck was 5 mm. each, while normally they are 3 and 5 mm. From the above, it will be seen that the length of the uterine body was 11 mm. longer than normal, and that this increase was mostly in the neck, which was about one-third longer than the normal. The cervical canal was enlarged, and the external os being very large for a child. The vagina was attached 8 mm. above the os posteriorly and 5 mm. above it anteriorly, the normal being about 5 mm. posteriorly, and 4 mm. anteriorly. On examining the appendices of the uterus, I found that, on the right side, they were normal, but, on the left, the body of the uterus was free from its attachment to the broad ligament for the distance of 12 mm.; there the broad ligament began, and passed outwards. The Fallopian tube seemed to enter the uterus just where the broad ligament began, but did not pass out on the free border of the ligament above the ovary, but was turned behind and below the ovary, so that the fimbriated extremity looked upwards. The ovaries were small, the right one being 13 mm. long and 2 mm. thick; the left one was 14 mm.

long and the same thickness, while normally they should be 16 to 17 mm. long, and 4 to 5 mm. thick.

The brain was removed in pieces, but they were large enough to show great congestion with subarachnoidal hemorrhages here and there, and one quite large one on the upper surface of the left posterior lobe of the cerebrum. The cerebellum and medulla were normal.

The microscopical examination of part of the scalp showed the strong resemblance of this case to those previously reported. (Figs. 3 and 6.) Here the thickened epidermis measured five mm. before it was put in alcohol, and had some fine hairs

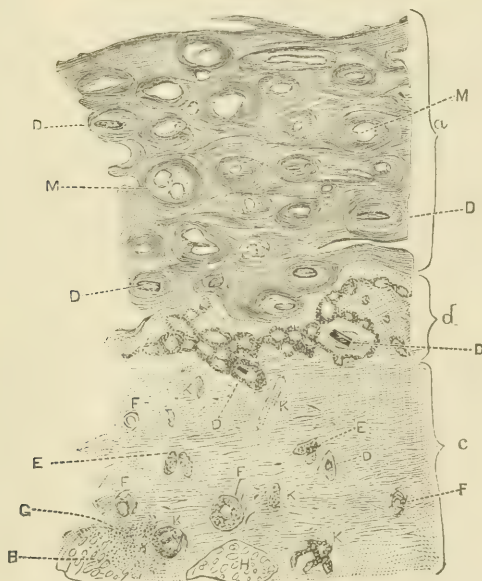


FIG. 3.— $\times 30$. Vertical section of skin of the head from the posterior auricular region; a, corium; b, rete Malpighii; c, subcutaneous connective tissue, fat, etc. D, hairs; E, sebaceous glands; F, arteries; G, extravasation of blood; H, fat; K and M, sweat glands and ducts.

attached to it; the sections were stained with carmine and hematoxylin, and mounted in balsam. These sections showed the hypertrophied papillæ, and also a change in the rete Malpighii, which, instead of consisting of a single row of cylindrical cells, was formed, first, of small round cells, whose nucleus was nearly the size of the cells; of these, there were from two to three rows; then came the cells that represented the normal rete, but they were more spindle-shaped than normal. These rows, taken together, formed a rete Malpighii of from two to three times the normal thickness. The row of cells next above the rete, was elongated in the opposite direction; above these the cells increased

very rapidly in size, being three to four times the normal diameter, their outlines well-defined, and, under a high power, showed the serrated edges. Then, as the cells continue to grow, this outline gradually disappears, and at last we have a homogeneous substance, with a nucleus to be seen only here and there. These nuclei soon fade away, and we finally have left the structureless keratoma. This is well shown in Fig. 6. The skin of the abdomen (Fig. 4) presents a very different condition; here the rete is

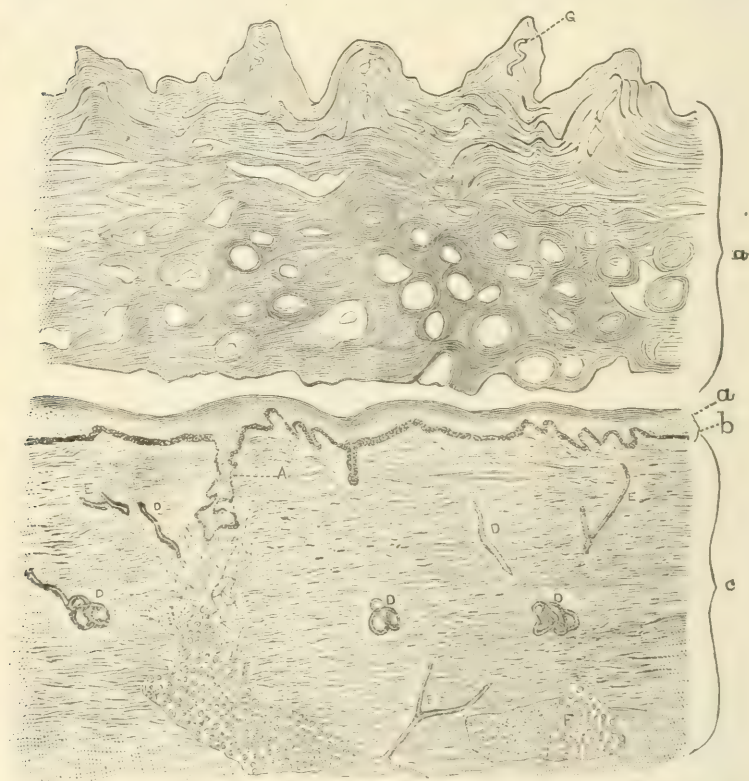


FIG. 4.—x 30, Vertical section of skin and plate from abdomen; *a*, *b* and *c*, same as in Fig. 3; *D*, sweat glands and ducts; *F*, fat; *G*, sweat ducts in corium; *A*, section of hair follicle with dilated glands.

normal, being, for the most part, represented by a single row of cylindrical cells passing normally to a normal corium, and its papillae do not show any increased size; but we know it was covered during life by the plate, two mm. thick, represented in the same cut. I notice in the literature that the parts examined have generally been those covered by a very thick and adherent keratoma, as the head, hands, feet, etc., and the report has always been such as I give above. But in one case reported by

Houel,¹ the report of the microscopical examination of the skin was that they found it normal as to its rete and papillæ, and that they could not verify Robin's statement about the hypertrophy of the papillæ and the changes in the rete Malpighii. Their skin came from the abdomen and thigh, and was covered by a keratoma varying in thickness from 1 to 2 mm. So it shows that the region from which the skin is taken, are factors in determining the thickness and adherence of the keratoma, the amount of change that will be found.

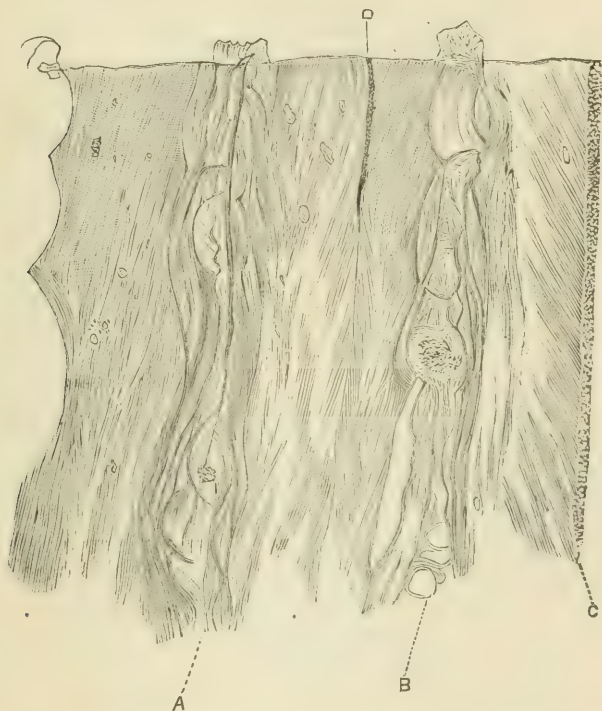


FIG. 5.—x 120. Horizontal section of plate from abdomen, same as in Fig. 4, showing dilated hair follicles; A, containing hair; B, not having any; C and D being merely a collection of granular matter.

The hypertrophied corium, or the keratoma, differs somewhat in the two regions examined. That from the head (Fig. 3, *a*) presents the sponge-like appearance mentioned by Müller, which is caused by the hairs, some of which have fallen out in the section from which the drawing was made; but in others they were to be found in every opening, and some long ones on the external surface. The enlargement of these hair sheaths was due to the drying and contraction of the keratoma, also to the retained sebaceous mat-

¹ No. 24 of list.

ter. The plate from the abdomen, figured in 4 and 5, showed in the vertical section (Fig. 4) that it differed from that of the head in not having so many openings for hairs, and that its external surface was covered with short papillæ that, on section, showed the remains of a sweat duct; and, although in the cut they are not shown to pass completely through the keratoma, as

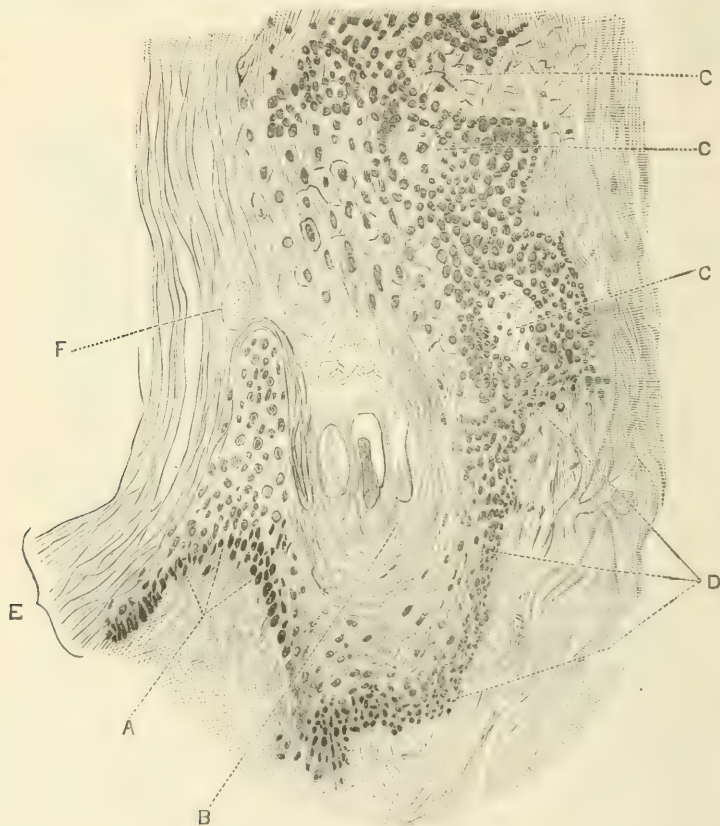


FIG. 6.—x 225. Part of Fig. 3, at the extreme right. A. Rete Malpighii; B, part of the keratoma; C and D, diseased rete showing the stages of formation of the keratoma; E, remains of the keratoma; F, remains of sebaceous matter in corium.

figured by Kyber, I found in other preparations, made at different angles, a piece here and there which, if put together, showed me would make a continuous duct. The hairs were few and small, and, like in Fig. 3, always bent nearly parallel to the skin, and not, as Kyber figures them, passing completely through the keratoma with their roots in the skin. In Fig. 5, we have a horizontal section of the same plate, and it shows two irregularly

dilated hair spaces, one of which contains the remains of a fine hair; the other showed only a mere trace of one; they are partially filled with pieces of the keratoma and the remains of sebaceous substance. The region between the follicles showed only a striated structureless substance. The sweat glands were normally developed, as shown in Figs. 3 and 4; their ducts penetrated the keratoma, and were not dilated or atrophied, as mentioned by Müller. The sebaceous glands were not fully developed, and were full of retained sebaceous material. The hairs were not well developed, and I never was able in thirty sections to find a root; neither did they pass directly through the keratoma, as observed by Kyber and others, but were turned over by the pressure of the new growth, and, as is showed in Fig. 5, were imbedded in the keratoma; in the case of the fine ones, for their whole length, in those of the head, for the greater part. The hairs that show in the figure of the child were only stuck in the keratoma, as one might stick them in wax, and were very easily pulled out. They only covered a very small region of the head. The cause of this peculiar arrangement of the hairs was the unyielding nature of the keratoma, and its pressure on the hair follicles caused the retention of the sebaceous material and the atrophy of the hair bulbs. I find the same results and causes reported by Müller, Jahn, and others, but Kyber does not find or figure these changes.

The fibrous structure of the skin was normal, but the subcutaneous fat (Fig. 3, H; Fig. 4, F) was not well developed; the globules, however, in themselves were normal, and the distribution was generally even in the hands and feet. The blood-vessels were full of blood, and here and there was a ruptured one, shown by a large number of red blood-cells free in the tissue (Fig. 3, G). The number and size of the blood-vessels was normal. The nerve endings in the skin were not seen in any preparation.

The chemistry of the scales of Ichthyosis has been well studied by Schlossberger, Marcet, Büchner, and others, but their results are based on the examination of scales from either Ichthyosis neonatorum, or that congenital form that occurs in the new-born calf. They found oil-globules, crystals of cholesterin, and hippuric acid in alcoholic extracts. In the ash were found phosphates of lime and magnesium, with a trace of gypsum and iron. I was able to verify this analysis, after the manner of Schlossberger, so far as to find fat, cholesterin, what might be hippuric acid, and, in the burnt residue, the salts of lime, magnesium, and iron.

This disease differs from those cases where one or more horny growths are produced in every respect; that it really differs so much from Ichthyosis neonatorum as some authors say, I am not prepared to confirm. It does resemble the state

of the skin found when the epidermis has been very much thickened by work or pressure.

This case of diffuse congenital keratoma is one in which the disease has shown itself in its most complete manner, being everywhere well developed.

On reading over the literature, we find the condition above described of the eyes, nose, mouth, ears, and tongue, is that which is generally given by writers on this subject; and in those cases in which the eyes are described as being represented by "red, fleshy, tender tumors," I believe the author did not examine carefully, and so overlooked the characteristic condition of the eyeballs. Some cases are reported as having the hands and feet naturally formed (Smith's), according to others, they were deformed as in ours (Jahn, Müller, etc.), and in others still (Souty), they are described as being merely rounded masses without any trace of form. The disease seems to show great variations as to the degree of development, for Kyber's case was washed and dressed, a thing out of the question with ours. One case (Levin's) is said to have had only the head and neck covered. The extreme hyperemia of the skin and internal organs is particularly mentioned by Jahn; the intense redness of the skin is noted by most writers. The occurrence of lobular pneumonia, noted in the case by Jahn, was not found in ours, nor can I find any mention of it in any of the others in which the autopsy is reported, and the pathological changes that are mentioned are those I have noted above. In the general congestion all agree, and in the want of any changes referable to syphilis. The thinning of the plate so as to leave the skin exposed in places was described exactly like this one by Müller, but the others do not mention it particularly; and one may infer from their description that it did not occur in so marked a degree, but were like what I have called cracks, as where the plate ended abruptly at the wrists, elbows, etc.

The disease was limited to the skin, and nowhere do I find any case in which there was any change in the mucous membranes, or in any of the internal organs which are developed from the same germinal layer as the skin. The tongue may be said to be an exception, but I merely find hear-say evidence of changes in it. In our case its enlargement was only appar-

ent, its protrusion being due to the retracted lower jaw and open mouth; there was no real increase of size.

The viability of these cases depends on the extent and development of the disease. A case like ours could not have lived, for there would have been suppuration between and under the plates, like Kyber's, that lived the longest on record. In cases where the disease was only partial or slightly developed, there would be no reason why the child should not live. Hebra says he knew of one case that recovered, and Perez¹ reports his as cured by iodine and lard externally. Those that have been seen during life have all been able to swallow, and often it seems as if death took place from neglect. It is generally said that these children are born too soon. Out of the seventeen cases in which I could ascertain the period of birth, ten are said to be at term, and seven were not. There seems never to have been any reported as a still-birth. The length of their life varies between a few minutes and nine days.

The health of the parents was in only one case noted as not being good, viz., Jahn's, where the mother was said to be suffering from osteomalacia. The sex in fourteen cases was mentioned; of these, five are male, eight female. It has generally been said to occur much more frequently in females than in males (Lebert). The recovery of the mother is mentioned in every case where there was any clinical history, so the death of the mother in our case must be taken as an exception. In those in which the number of the pregnancy was mentioned, in only two was it the first, and in one case the second child was similar to the first; in no other case was any skin disease present in the family.

The time during intrauterine life at which this disease begins is stated by Müller to be between the second and third month. Kyber believes it begins during the third or fourth month, and comes to this conclusion after examining the sweat and sebaceous glands and hairs. We know from Kölliker² that the rete Malpighii is not developed until the third month. Up to that time no difference exists between the cell layers composing the skin, and, as we believe this disease has its origin in the rete, it could not have commenced as early as the second month.

¹ No. 27 of list.

² *Entwicklungsgeschichte*, 2 Auf., 1879.

If we follow Kyber's method, and try to draw conclusions from the sweat and sebaceous glands and hairs, we find that the ducts of the sweat glands reach to the outer layer of the keratoma, and that the glands are well developed. These glands, according to Kölliker, begin as prolongations from the rete in the fifth month, and their ducts do not open externally until the seventh, and this leads to one of two conclusions, viz., either the duct could grow through the keratoma as through a normal epidermis, or the disease did not begin before the end of the sixth month. If we take the hairs and sebaceous glands in our case, the hairs do not penetrate the keratoma as in Kyber's, but resemble that of Müller in their flattened and undeveloped condition. The sebaceous glands begin to develop after the hairs in prolongation from the sides of the hair follicle at the end of the fourth or beginning of the fifth month, while the hairs were developed one month before. Now we find the hairs over the scalp, on the outer surface of the keratoma, so we see the commencement of the disease could not have varied much from the time of the first appearance of the hairs, or that the disease began about the beginning of the fourth month, as Kyber says, and that the ducts of the sweat glands have been able to penetrate the keratoma.

The cause of this peculiar disease is, like that of most new growths, unknown; and we must be content with a definition. We have an accumulation of the hypertrophied epithelial elements of the skin, which takes its origin in a disturbance of the rete Malpighii, and afterwards develops a very rapid increase in the cell-bodies; said by Jahn to be due to a sero-fibrinous exudation.

The history of diffuse congenital keratoma is meagre. Such works as Mason Good's, in 1834, gives only a very short and general description of the disease, and ascribes the plates to hardening of the sebaceous secretion. The first good description of the disease we find by Sir James Y. Simpson in the *Edinburgh Medical Journal* for 1840; but it is to Heinrich Müller, in 1850, that we owe the first clear and complete microscopical examination of this disease, and to-day we are able to verify most of his conclusions.

The special literature is appended to this article, and I have added a list of some of the general works that touch on the

subject. The table contains the cases and all the principal points as far as I could ascertain them. Considerable of the literature was not accessible, and I had to be satisfied with what references, I could find.

Allow me, in conclusion, to thank Dr. George G. Wheelock, in whose service at the hospital it occurred, for his kindness in allowing me to report the case thus fully, and to express my thanks to Dr. Nelson H. Henry, the resident physician, for the clinical notes.

The following authors have written on this subject, but I do not know if they add any new cases or not, as I could not get at the original of articles.

LIEBREICH, 1850. Ichthyose Interuterina. Hallæ, 1850. Reports twelve cases, three being in the new-born calf.

H. LEBERT. Ueber Keratose. Breslau, 1864.

List of General Works Containing Chapters on Ichthyosis.

RAYER. Traité des Maladies de la Peau. Tome ii.

HEBRA. Works on Skin Diseases (New Sydenham Ed.), v. iii.

MASON GOOD. Studies of Medicine, 4th ed. G. S. Cooper, London, 1834, vol. iv.

ERASMUS WILSON. Skin Diseases. First ed.

SIR JAMES Y. SIMPSON. Obstetric Works, Am. ed., vol. ii., page 348, 1856.

BÜCHNER. Archives für Physical. Heilkunde, 1854.

V. BÄRENSPRUNG. Die Hautkrankheiten. Erlangen, 1859.

LOUIS PELLETIER. Considérations historiques et histologiques sur l'Ichthyose en général. Paris, 1879.

BUCKLEY'S NEUMANN. Skin Diseases, 1879.

NAYLER. Skin Diseases, 1866.

C. GERHARDT. Lehrbuch der Kinderkrankheiten, 4te Aufl., 1881.

D'ESPINE ET PICOT. Maladies de l'Enfance, 2d ed., 1880.

KLEBS. Handbuch der Pathologischen Anatomie, vol. i.

RINDFLEISCH. Lehrbuch der Pathologischen Gewebelehre, 1878.

ZIEGLER. Lehrbuch der Pathologischen Anatomie, etc., vol. i., 1881.

A list of all the cases that could be found up to the present with notes and references.

NO.—CASE OF	DATE.	SEX.	WEIGHT.	LENGTH.	LIVED.	PREGNANCY.	CONDITION OF PARENTS.	WHEN BORN.	WHERE REPORTED.	REMARKS.
1. Richter	1792	3 days..	Fourth..	8 mos ..	Obs. Works of Sir James Y. Simpson, L. c.	{The original was an inaugural dissertation under Ichthyosis Congenita, Berlin, 1828. The only note is "fetus in Guy's Hospital." Nayler reports on page 60 that there are four cases in the Guy's Hospital Museum, and of only one (Scarr's) could he find any notes. I count one as reported by Simpson, and add two as unknown.
2. Hinze	1802	F	8½ lbs.	26 in..	4 days..	.....	Healthy	Term ..	L. c.
3. Steinhausen.	1828	F	1½ lbs.	18 in..	3½ days.	.....	do.	Term ...	L. c.
4. Simpson	1840	.....	.....	.....	.....	.....	.....	.....	L. c.
5. Scarr	1840	Few minutes	Not the first.	Healthy	Nayler on diseases of the skin, 1865, 1866, L. c.	{The original was "De congenita epidermis hypertrophica," Moscow, 1843.
6. Unknown...	1840	.....	.....	.....	.....	.....	.....	.....	L. c.
7. Unknown...	1840	.....	.....	.....	.....	.....	.....	.....	L. c.
8. Sierruk	1840	M .....	.....	.....	.....	.....	.....	Not at term.	Medizinische Jahrbücher, Wien, 1880, p. 408.
9. Sierruk	1840	F	Not at term.	L. c.	

No.—CASE OF	DATE.	SEX.	WEIGHT.	LENGTH.	LIVED.	PREGNANCY.	CONDITION OF PARENTS.	WHEN BORN.	WHERE REPORTED.	REMARKS.
10. Lewins.....	1840	2-3 days	A large family	Healthy	Term ...	Obs. Works of Sir James Y. Simpson.	I did not see the original. { Saw the case quoted by Kyber and Simpson and others.
11. Gluge.....	1841	.....	.....	.....	.....	.....	.....	.....	Abhand. f. Phy. et Path. Jena, 1841, p. 138.
12. Vrolik.....	1841	M .....	.....	27 in..	3 hours.	.....	Healthy	8 mos ..	Dutch Med. Jahrbücher, 1841.
13. Souty	1842	M	2655 grams	39 cm.	50 hours	Third ..	do.	Term ...	Bull. de l'Académie de médecine, Oct., 1842.	I have only seen the reference to it in Jahn's paper.
14. Keller	1843	F .....	.....	.....	12 hours	.....	do.	Term ...	Simpson, l. c.
15. Müller	1850	F	3½ lbs.	16 in..	3 days.	.....	do.	6-7 mos.	Verhand d. Physi. Med. Gesellsch., Würzburg, B. I., p. 119.
16. Heije	1852	7-8 mos.	Archief. voor de Geneeskund, D. I. St. 4, II. 52.	L. c.
17. Okel	1854	.....	.....	.....	8 days..	.....	.....	.....	{ Vern. Abhand. a. d. Gebiete d. Heilkunde v. einer Gesellschaft prakt. Aerzte in Pestersburg, 1854.
18. Houel	1853	.....	.....	.....	.....	.....	.....	Term ...	{ Comptes Rendus à la Société de Biologie, 7. iv., p. 178, 1853.
19. Schnarbel...	1856	F	Inaugural Dissertation, Stuttgart, 1856.	Case in the Tübingen museum.

No.—CASE OF.	DATE.	SEX.	WEIGHT.	LENGTH.	LIVED.	PREGNANCY.	CONDITION OF PARENTS.	WHEN BORN.	WHERE REPORTED.	REMARKS.
21. Jahn	1870	F	4 $\frac{3}{4}$ lbs.	40 cm.	9 days ..	Third....	Healthy	8 mos....	Jahr. f. Kinderhk., N. F. B. iii., 1870, p. 204-316.	• I only saw the quotation in the Arch. f. Dermat., 1877, p. 204.
22. Lôcherer....	1877	M ....	.....	.....	2 days ..	Fourth..	do.	Term ...	Aerztliches Intelligenzblatt, 1876, p. 293.
23. Houel	1879	.....	.....	.....	10 hours	First....	do.	do.	Progrès Medical, 1879, p. 428.
24. Houel	1879	27 hours	Second..	do.	do.	L. c.	I have not seen the original, but he is said to report a case.
25. Kyber	1880	F ....	.....	36.5 cm.	36 hours	First....	do.	7 mos...	Medizinisch. Jahrbücher, Wien, 1880, p. 397.
26. Smith	1880	M ....	.....	.....	3 days..	Third...	do.	Term ...	AMERICAN JOURNAL OF OBSTETRICS, 1880.
27. Perez.....	1880	M	Recov'd	Prog. médicale, 1880, p. 524.	
28. Strahlinger..	1880	... ..	.....	.....	.....	.....	.....	.....	Dissertation, Marburg, 1880.

ABSTRACTS.

1. Féré: Hernia Incarcerata in Infancy (*Révue de Chirurgie*).—CH. FÉRÉ has collected from the literature of the subject 56 cases of hernia incarcerata inguinalis in children under two years of age. Among these there was only one girl. 38 were under eight months old; 75 per cent were upon the right side. It could not be stated with certainty how frequently these herniæ were congenital, nor what was the relation between the first appearance of the hernia and the time of the incarceration. In the majority of cases the point of stricture was at the inner ring. The symptoms of strangulation are in general the same as in adults, but children appear to become more rapidly greatly exhausted, and the severe manifestations follow one another more rapidly. Thus, Pott saw gangrene of the intestine occur within forty-eight hours, and Goach saw in a child six weeks old the formation of a fecal abscess and an anus præternaturalis with a result in cure. Herniotomy has better chances the earlier it is undertaken and the less energetic the attempts at reduction made beforehand. Of 52 children operated upon under two years of age, 18 died (34.6 per cent); of 29 from six months to two years of age, 7 died (24 per cent); of 20 under six months of age, 11 died. It may be further stated that the percentage of mortality is in fact greater, because the majority of unsuccessful cases are not published. Nevertheless, cures are made in very young children, having been reported at seventeen days of age, at three weeks, and at sixteen weeks. Féré recommends that when the incarceration has existed twenty-four hours, no attempt at reposition should be made. The mortality is much less when the sac does not have to be opened, but after twenty-four to thirty-six hours of strangulation this generally cannot be avoided. Féré reports a case in which he performed the operation upon both sides. It was, however, fatal.

J. M. COTTERILL (in the *British Medical Journal*, 1,064) reports an operation upon a child nine weeks old in whom a congenital right inguinal hernia had suddenly become strangulated. In spite of a large scrotal tumor, no intestine could be discovered even under chloroform. The child only had symptoms of very violent pain and intense collapse, but no vomiting and no obstipation. After opening the hernial sac and letting out about two ounces of bloody serum, there was found incarcerated a piece of intestinal wall about as large as a bean, which, after incision of the ring, was easily replaced. The wound was closed with catgut, and complete and rapid cure followed.

J. FEWSMITH, JR.

2. Demme: The Study and Treatment of so-called Cholera Estiva (*Report of the Bern Hospital*).—PROF. DEMME selects from the collective term cholera estiva those very acute diseases of intestine in infants which are introduced with the appearances of an infectious disease, with a temperature of from 39° to 40° C., with a tendency to sopor, or even coma, with convulsions, watery diarrhea, and vomiting, and which must be considered acute intestinal mycoses, with invasion by the micrococci of the lymph-tracts, especially the lymph-glands of the digestive tract, the chyle-vessels, and the mesenteric glands. For these comparatively rare

cases Demme reserves the name cholera estiva. He speaks very reservedly of the form and growth of the fungus, which, however, in three cases he found constantly present. He treated the cases by washing out the intestine with a 2.5 to 5 per cent solution of boracic acid, but lost half of his patients, and he remarks that if the large amount of fluid does not rapidly flow off again, ominous obstruction of the respiration and circulation may be easily caused by it. He had better results from washing out the stomach with a 1 to 2.5 per cent solution by means of a very thin bougie; the proceeding, however, is difficult on account of the vomiting and symptoms of suffocation. Of seven cases so treated, five were cured. In the internal use of antiseptics in suitable doses, combined with a small dose of opium, creasote, acid carbol., sodium, and magnesium benzoate, proved effective against the vomiting. Resorcine was unreliable; boracic and salicylic acid less effective. None of these preparations diminished the fungus in the injections, probably on account of the small amounts of them which can be given. The doses which Demme used were:—Acid. carb. cryst., 0.02–0.05 per cent; acid. benzoic., 1–3 per cent; sodium and magnes. benz., 3–10 per cent; creasote, 0.02–0.04 per cent; sodium salicyl., 1–3 per cent; resorcine, 0.1–0.2 per cent; acid chlor., 5–10 per cent—all with the addition of from 2.0–3.0 pulv. gumm., and the use of 50.0 grms. of a solution in distilled water per diem. The benzoate of soda worked best because the dose could without fear be increased. Demme recommends also the use of calomel 0.005–0.01 pro die. Of astringents, the best are bismuth subnitric., bismuth tannic., and quinine tannic. Where the peristaltic action is much increased, even when there is great sopor and weakness, he gives opium 0.0005–0.001 pro dosi in union with active stimulants. For tenesmus he recommends the introduction of small rounded bits of ice into the rectum. As stimulants he recommends almost exclusively cognac in rice-water or a weak infusion of Russian tea, subcutaneous injections of tincture of musk and ether, and hot mustard baths.

J. FEWSMITH, JR.

3. Seiler: Ascites in Childhood (*Berl. klin. W.*, 26).—DR. SEILER gives it as his opinion that simple ascites in childhood, when tuberculosis is excluded, always depends upon hepatitis syphilitica diffusa or circumscripta gummosa, even in cases where all other signs of a syphilitic disease are wanting. The cases, so far as he knows, are all to be placed in the category of hereditary syphilis, and are curable by mercury and iodine. The only other possibility which he acknowledges is that there may occur in childhood a curable idiopathic hypertrophic liver cirrhosis. Dr. S. is not able to bring anatomical proof of the correctness of his statement, but reports observations which may serve to illustrate it. We omit these here, as they simply show the disappearance of the ascites in these cases under anti-syphilitic treatment. The ascites may be due to local disease of the peritoneum or to circulatory disturbances in the portal system. Ascites as a consequence of chronic primary peritonitis is not a clinimal certainty, though Hensch has claimed its existence in one case of traumatic origin. The existence of liver cirrhosis in childhood is also not proved; its occurrence even doubtful. Cases classed under this head all appear to depend upon syphilis, and, moreover, the diffuse syphilitic hepatitis and the hypertrophic stage of cirrhosis cannot with certainty be anatomically distinguished.

J. FEWSMITH, JR.

4. Epstein: Cholera Infantum and its Treatment (*Prager Med. W.*, 1881).—DR. A. EPSTEIN opens his article on this subject with some words which are worthy of consideration. Although it is certain that the great mortality of the first years of life is due principally to diseases of the digestive tract, though it is right to place in the foreground of pediatrics the question of nourishment of infants, yet he must raise his voice in warning: “*Est modus in rebus;*” and not all diseases of the digestive tract of infants are the immediate result of wrong methods of feeding, and to be cured by a change from faulty nourishment. Cholera infantum, especially, when it occurs suddenly and without apparent cause, does not seem always to be due to the food which is being used. The experience of the physicians of the Prague Foundling Asylum, where the best of nurses are furnished to the children, show that, nevertheless, dangerous and deadly diseases often occur in the institution. The care and cleanliness of the child demand the strictest attention. Dr. E. thinks, therefore, that we are forced to conclude that there is a peculiar condition of the air which causes diseased fermentive processes in the digestive tract of children, and notes that in the institution quite frequently there are observed violent and obstinate acute gastro-intestinal catarrh among the adults living there, and these are as inexplicable as those among the infants. It is remarkable also that in this institution the absolute and relative number of acute intestinal catarrhs and cholera cases is greatest in the cool spring and winter months, and their course then is most severe—an observation which opposes those made in other places. The institution is, however, just in these cool months most crowded, and the condition of the air the worst. Dr. E. is of opinion that the vomiting and diarrhea of infants are dangerous symptoms of a dangerous disease. The severe collapse points to this (occurring sometimes even before the fluid evacuations). The almost inappreciable anatomical changes of the intestines, the rise of temperature, sometimes twenty-four to twenty-eight hours before the occurrence of the first symptoms, the enormous temperatures up to 40° C., and, finally, the swelling of the spleen, which may often be found immediately before the disease, but diminishes rapidly at the commencement of the diarrhea. At present, he gives no decided opinion in regard to intestinal mycosis in these cases, but is sure that the action of the organisms is not indifferent. He had not had satisfying results from the medicines in general use, but he thinks the best are acetate of lead and extract rhatanae. The most important thing is immediately at the beginning of the disease to stop giving woman's or cow's milk, and to give instead water of the white of eggs. The white of one egg is well stirred in from one-half to one quart of boiled water, and kept in a clean bottle in a cool place. To this is added one to two teaspoons of sugar and to young infants fifty gms. given every two hours; to older ones more. Nourishment by the breasts is not to be again begun until continued weighings show that there is no further decrease in weight, and even then the breast must be given at first only two or three times a day. When the sickness begins with the vomiting of sour masses, Dr. E. washes out the stomach by means of a bougie, and thus usually controls the vomiting, and often cuts short the whole attack. For this, he uses warm, distilled water, sometimes with the addition of benzoate of soda. Besides this, he gives every two hours a teaspoonful of Natron. benz., 5.0;

Spir. Vini rect. or cognac, 2.0; aq. distill., 100.0, with sometimes wine in addition, 1 to 2 drops of sulphuric ether and tinct. valarian aa in a teaspoonful water, and rubbings with a mixture of equal parts of spiritus and oil. When brain symptoms are predominant, he recommends every half-hour a teaspoonful of chloral hydrat., 0.5; aquæ, 50.0, or wet packings, or, when the rectum is involved, a clysm of a two-per-cent boracic acid solution or a 0.4-per-cent nitrate of silver solution.

Dr. E. considers himself justified in most highly recommending these methods of treatment.

J. FEWSMITH, JR.

5. Heyne: Are Caustics or Disinfectants to be used in Diphtheria? (*Discussion in Med. Soc., Berlin*).—DR. HEYNE considers diphtheria a disease caused entirely by vegetable fungi, and that certain conditions of the fluids of the throat favor the growth of these elements, and that in scrofulous and tubercular children especially, the conditions are so favorable that the disease may develop spontaneously, while in healthy children a direct contagion with the growing fungus is necessary. He claims that the natural barrier to the further growth into the tissues of the fungus is formed by the layer of pus which separates the false membrane, and that no use of caustics would completely destroy the fungus, while even a moderate use of it causes deep destruction of tissues, and opens new ports of entry into the circulation. In regard to disinfectants, while it is impossible to so thoroughly disinfect the throat as to prevent the growth of the fungus without doing injury to the larynx and bronchi, yet in cases of slough or gangrene, disinfectants should be used to prevent the absorption of further infection from these.

He concludes: "Under all circumstances, and in all forms of diphtheria, caustics are contra-indicated, while in the sloughy or gangrenous forms, disinfectants may be used, not to destroy the fungus, but to protect the tissues from the effect of the sloughs."

Dr. Strassmann would do away with the caustics entirely, and use disinfectants very cautiously to avoid irritating the membrane. Dr. Löwenstein was also opposed to caustics, but in slow cases, in which the deposit did not readily clear off, he occasionally used, with good effect, a two to three per cent solution of argenti nitras.

The general verdict of the Society was about in this latter sense.

J. FEWSMITH, JR.

6. Weber: A New Cause of Diphtheria (*Allg. Med. Central. Zeit., 67*).—DR. H. WEBER declares that it is perfectly clear to him that potatoes stand in direct causal connection to diphtheria! Diphtheria, or croup, first appeared in Europe at the close of the 16th century, that is, later than potatoes. It is certain that the occurrence of the disease of late years has increased with the increased planting of potatoes. The most severe epidemics of diphtheria occur at the times of the sowing and the gathering of the potatoes, and children from two to three years are then especially attacked—especially, because they play with the "evil bulbs," which the older children cannot do, because they have to go to school. Diphtheria is rarer in Schmalkalden than in Malstadt-Burdach, because, in the former place, potatoes are bought in small quantities, while, in the latter, large provisions of them are laid in, and the people, therefore, come more often in contact with spoiled ones. Weber says: "These are certainly good arguments." The editor of the *Jahrbuch* says: "There

might possibly be some arguments brought forward on the other side, which should be quite striking." [This abstract is inserted merely as an example of the absurd extent to which theorizing can be carried.—Ed.]

J. FEWSMITH, JR.

7. Cornil: Histology of Diphtheritic Tonsillitis (*Arch. de Physiologie*, 3, 1881).—V. CORNIL regards the tonsils as large lymph glands with depressions into which the membrane sinks. These depressions are lined with a simple layer of follicles and reticular tissue, covered outwardly with a fibrous layer. They contain loose epithelial cells, lymphatic round cells, and all the varieties of fungus found in the mouth. Diphtheritic membrane from the trachea, freshly examined, consists of a fibrinous network zooglea, schizomycetes, and lymph corpuscles. In the crypts of the tonsils, the same false membrane is found as on the surface. The superficial false membrane, under a high power, shows several layers of zooglea in round heaps, separated from one another by the fibrinous network. Under this, a transparent basement membrane, which incloses fine micrococci dust, which becomes scantier as we go deeper, while red and white blood-corpuscles become more plentiful. Under the false membrane, the epithelium is wanting, and the boundary line between it and the mucous membrane is lost. The mucous membrane itself is infiltrated with red and white blood-corpuscles, and its capillaries filled with white corpuscles. The false membrane in the crypts of the tonsils either consisted of a fine fibrinous network alone, the epithelium being entirely wanting, or the crypts were filled with fibrinous coagula, which did not adhere to the mucous membrane, in which case the epithelium also was wanting; or, finally, the superficial false membrane extended over the entrance to the crypt without sinking into it, in which case the latter was filled with simple epithelial and lymph cells. The so-called throat granulations, some of which were covered with false membrane, showed greatly enlarged lymph-follicles, and the neighboring tissue was richly infiltrated with lymph-corpuscles. Neighboring lymph-glands contained many micrococci and bacteria.

J. FEWSMITH, JR.

8. Meyer: Pathological Anatomy of Diphtheritic Paralysis (*Virchow's Archiv*, 85 B., 2 H.).—DR. PAUL MEYER found in a case of diphtheritic paralysis which ended fatally in the seventh week that the peripheral nervous system was in all parts the seat of extensive changes—splitting of the mark, increase of the corpuscles of the membrane of Schwann, even total destruction, in short, all the changes which occur in parenchymatous neuritis. Thus, the nervous phrenicus to its finest branches was in a state of parenchymatous degeneration. In portions genuine tubercles were found, in which the nerve-fibres were separated into various small bundles, or appeared torn out from one another; while the tubercles themselves were formed of edematous and inflamed interfascicular connective tissue. The affection was very diffuse, being found in the nerve-fibres of almost all muscles of the body and extremities. The cerebral nerves were strongly affected; the sympathetic not at all. The roots of the spinal nerves showed all the criteria of parenchymatous neuritis. In some cervico-dorsal and lumbar-spinal ganglia the same changes were found. The spinal cord itself was nearly normal, and the muscles were nowhere greatly altered. Dr. M. is decidedly opposed to considering the process as a primary polio-myelitis anterior with secondary neuritis (Déjerine—Charcot); nor will he admit the designation neuritis ascen-

dens (Leyden); but claims that the diphtheritic contagion causes the same changes and in the same way primarily upon the periphery and spinal centres. Dr. M. uses the name neuritis in the modern sense, although all clinical symptoms of inflammation were wanting. The neuritic changes were partially parenchymatous, partially interstitial; that is, affecting the interstitial connective tissue. In no part of the nervous system did he discover the microsporon diphtheritica (Klebs). J. FEWSMITH, JR.

9. Rennert: The Hereditary Consequences of Chronic Lead-Poisoning (*Arch. f. Gynæk.*, 18 B., 1 H.).—DR. O. RENNERT reports an examination of seventy-five children out of eleven families of potters, in which all of the fathers and two of the mothers had suffered from severe lead-poisoning.

First family:—Father and mother, severe lead-poisoning. 8 children, of which 2 died young from convulsions; all the other 6 had large angular heads; all suffered from convulsions; 1 was idiotic; 2 showed symptoms of lead-poisoning, but none had rachitis.

Second family:—Both parents lead-poisoning. 10 births; once twins, of which 1 immediately died; the living 10 children, strikingly macrocephalic, suffered frequently from convulsions.

Third family:—Father with severe lead-poisoning, mother with slight. 5 children, all with large heads: 3 died; 1 from convulsions, 2 interpartum; the 2 living rachitic, 1 suffering from lead-poisoning and idiotic.

Fourth family:—Father severely poisoned, mother slightly. 10 children; 7 died, all with convulsions, all with very large heads; the 3 living all suffered from convulsions, and the oldest son at 19 years had an atrophic paralysis of the left arm.

Fifth family:—Both parents poisoned. 11 children: all with the exception of a stillborn died from convulsions, all with large angular heads.

Sixth family:—Father sick, drunkard; mother healthy. 4 children; 2 macrocephalic, died from convulsions.

Seventh family:—Father poisoned, mother slightly. 4 children; 2 died; 2 suffered frequently from convulsions.

Eighth family:—Father poisoned, mother healthy. 8 children: 3 macrocephalic, died from convulsions; other 5 healthy.

Ninth family:—Father poisoned, mother healthy. 3 children, the oldest living, macrocephalic; 2 died without enlargement of the head.

Tenth family:—Father very slightly sick, mother healthy. 8 children: only 1 macrocephalic.

Eleventh family:—7 children from two marriages; 4 stillborn; 2 from each wife; 1 died of apoplexy; 1 living and macrocephalic.

Dr. Rennert is of the opinion that these children suffered from cerebral hypertrophy, because the macrocephalus was comparatively moderate and of slow growth. The children otherwise strong and healthy, the crania angular, and the intelligence not greatly disturbed, and because some autopsies confirmed this opinion. J. FEWSMITH, JR.

10. Heubner: Contribution to our Knowledge of Hereditary Syphilis (*Virchow's Archiv*).—DR. O. HEUBNER offers a welcome contribution to our knowledge of articular and periarticular suppuration in hereditary syphilitic disease of bones. A child two months old was attacked with fever, clear syphilitic eruption, and a painful swelling of left wrist and

both ankles, and an abscess under the left malleolus externus. Another abscess formed on the internal malleolus; the fever continued, and the child died after one month. At the autopsy, several small abscesses were found in the periarticular tissue of the left wrist; the radio-carpal joint was normal; only the epiphysal end of the radius somewhat thickened. Between the first and second rows of carpal bones was some pus, and the synovial membrane was discolored and rough. The left knee-joint was normal, the lower epiphysis of the left femur somewhat enlarged, and easily separated from the shaft. On section, the zone of the growing cartilage was found extended. The same changes were found on the ends of the tibia.

The microscope showed that the zone of the formed cells was about normal, but the zone of the cartilage cells and the boundaries of ossification were three times as broad as normal; while the ossification was going forward very irregularly. The long course of fever in the case was explained by the multiple abscesses found about the joints. H. at present only claims that his case shows that the joint inflammations in hereditary syphilis are secondary to disease of the epiphyses. He narrates other cases to show the same point.

DR. C. VERAGUTH has an article in the same journal in which he claims that the separation of the epiphyses in hereditary syphilis depends on a sort of chondritis, more closely agreeing with Heubner than with Haab, Parrot, and Taylor. Dr. V. explains the process thus:—In consequence of syphilis, there is first a greatly increased vascularization in the cartilage, and with this a growth of its cellular elements, which, of course, is most profuse in the proliferating zone, and there causes inflammation. In consequence of the abnormally increased flow of secretions, the adhesive substance (cement) of the fibrillæ becomes dissolved; they become loosened, and form "cracks," which run together and enlarge until they reach the perichondrium, and there complete the separation of the cartilage.

V. has never seen a change of the marrow into granulation tissue, and a growth of this into the interstices of the bone, but he considers it possible that it occurs.

J. FEWSMITH, JR.

11. Kassowitz: Rachitis and Syphilis (*Wien. med. Blätter*).—The statement of Dr. Parrot at the London Medical Congress, that he considered "rachitis the consequence of syphilis, only not contagious," has awakened active opposition on all sides. Kassowitz, supported by exhaustive histological examinations, defines the rachitic process as a "chronic inflammation at the points of apposition of the growing bones, characterized by increased development of blood-vessels and by increased flow of blood." Even in normal processes of ossification, the great vascularization plays an important rôle. The deposit of lime salts and the formation of bone tissue never approaches beyond a certain distance from the walls of the blood-vessels as long as the current in them is active. If, for experiment, the vascularity at any point is increased, the bone formation and deposit of lime salts is greatly decreased, or, if the vascular current is very strong, already formed bone may again lose its salts, and fall back into soft tissue. Kassowitz, therefore, regards the inflammatory vascularization as the *causa movens* in rachitis, and claims that on this theory all the stages and symptoms of the disease are more readily explained than on any other hypothesis.

When we now take into consideration that bones do not grow by general expansion, but only by the deposit of new strata, and that in consequence of this the point of growth is smaller comparatively than in any other organs, and hence there is an enormous amount of energy and activity of the various fluids and "juices" at this point, then it is easy to understand how any kind of inflammatory irritant which might be circulating in the secretions during the period of bone growth, should make itself felt principally in the bones, and most especially at the growing points of apposition.

There is no question that poverty, bad dwellings, bad nourishment (the latter less than the others, for rachitis is found in well-nourished children of healthy mothers), and the most various diseases which weaken the organism, ground a predisposition to rachitis. K. remarks that rachitis is more frequently of intrauterine development than has been supposed, and he attributes it to the passage of some irritant from the mother's blood to that of the fetus. The supposed inflammatory irritants causing rachitis may be of most varied nature.

This view of rachitis is in accordance with the failure of the lime treatment, as the salts cannot be deposited in the supervascularized tissues, and also with the spontaneous cure of the disease at the time when the great activity of bone-growth, and with this the great flow of nutritious juices has ceased.

We must, therefore, admit as reasonable the fact that, if at the time of active growth of bone, there is in the blood some syphilitic virus (which so constantly acts as an irritant to chronic inflammatory processes), this would make itself felt at exactly those points which are predisposed or predilected for rachitis. Leaving out of view, therefore, the intense and peculiar diseases of bone which are particularly caused by hereditary syphilis, we must at least admit that the latter may be *one of the many causes of rachitis*. On the other hand, K. states that it is certain that eighty per cent of all rachitic children are absolutely free from syphilis. Craniotabes he also considers non-syphilitic. It has all the characteristics of rachitis, and in only a small number of cases has there been any evidence of hereditary syphilis.

Out of two hundred children, one hundred and sixty-five were markedly rachitic, thirty-five not so. Of the one hundred and sixty-five rachitic ones, ninety-two had craniotabes. Of the whole two hundred, only six had hereditary syphilis.

J. FEWSMITH, JR.

12. Dr. S. Troizki: Urethral Calculus in an Infant (*Analekten of Jahrbch.*).—The author had the rare opportunity of seeing a urethral stone in a boy only one month old. The boy was otherwise healthy, but from the eighth day on, the mother noticed that he cried when attempting to pass water, and seemed to get along easier when the pelvis was elevated. At the end of the first month, the difficulty increased, and raising the pelvis did no good. The author saw the child after twenty-four hours' retention of urine, and found a swelling about the middle of the penis, which was evidently caused by a urethral calculus. By a milking movement, it was pushed forward to the meatus: this was laid open, and the stone removed. It was hard, yellowish-brown, and weighed 0.25 gm., was eight mm. long and five broad, and gave the murexid reaction.

After its removal, the boy passed a glass of acid urine containing crystals of uric acid and urates. Judging from the size of the stone, it must have been of intrauterine development. An uncle of the child died of urolithiasis.

J. FEWSMITH, JR.

13. A. Tederoff: Hermaphroditismus (*Moscow Hospital Reports*).—A child of six months, who had been baptized as boy, died of pneumonia in the hospital. The external genitals consisted of a penis-like body two and a half centimetres long, with a glans and movable prepuce; further, two folds of skin like labia extending from the roots of the penis backward toward the perineum, and there united; further, two tender folds of skin resembling the nymphæ, which extended from the prepuce as a continuation of the same backward to the posterior commissure. On the lower surface of the glans was a groove which continued between the nymphæ, and passed into an opening in the posterior commissure connecting with the bladder. Back of the orifice of the urethra was a large opening, the vagina, surrounded by two folds of skin. The anus was normal—all three openings separated by bridges of skin, and not communicating. In the right inguinal canal was a round body, reminding one of a testicle. At the autopsy, there was found a vagina and apparently normal uterus. The right Fallopian tube ran along the inguinal canal, and became blended with the fibrous investment of the testicle. Parallel to this was another cord, which was continuous with the epididymis. The left ligamen. latum also contained two cords. The upper ended in a fimbriated extremity, and opposite to this lay an oval body resembling an ovary, which was connected to the uterus by the lower cord. Neither prostate nor vesiculæ seminales were to be found. According to this gross anatomical examination, the case might have been considered one of hermaphroditismus lateralis. But the microscopical examination showed that not only the body resembling the testicles, but also that resembling the ovary, were really testicles, while the swelling of the left tube and the body on the right side, resembling the epididymis, were both, in fact, epididymes. The vasa deferentia were so intimately connected with the uterus that their further course could not be followed. Finally, the walls of the uterus consisted not of muscular substance, but of the glandular tissue of the prostate, and it was therefore a strongly developed uterus masculinus. The case must therefore be considered as one of hermaph. transversalis, though the author holds that this designation is not entirely correct, because in all cases which have heretofore been examined with sufficient care, only the external genital organs have presented more or less resemblance to the female, while the genital glands under microscopical examination have always shown themselves to be masculine. It would be better, therefore, to denominate such cases as false hermaphroditismus to be classed with hypospadias. In closing, the author remarks that his case is the only one of that kind in which the urethra and vagina opened separately.

J. FEWSMITH, JR.

14. M. J. Parrot: Aphthæ and Gangrene of the Vulva in Infants (*Revue de Méd.*).—Parrot offers an analysis of fifty-six cases of vulvitis aphthosa. The disease was not limited to the vagina, but extended to the perineum, anus, genito-crural folds, and groins. On the vulva it occurs twice as often upon the labia majora as upon the labia minora. In the beginning, these aphthæ are small, half-circular, white or grayish

plaques with depressed centres, their diameter, 1 mm. to 4 mm., resembling the aphthæ of the membrane of the mouth, occurring isolated or in groups, and often confluent. They remain in this stage, which is seldom observed, and then form ulcers with a gray or yellow base and a red edge, generally causing itching. The surrounding parts may become much swollen, and the ulceration, by extension, may reach several square centimetres. Under proper treatment, the ulceration is quickly cured; with improper treatment or none, it frequently results in gangrene. In this case, the ulcers become covered with a grayish-brown or black slough, the surrounding tissues swell, become livid and indurated, edematous and painful. The gangrene (moist variety) uninterruptedly extends upon vulva, penis, anus, all surrounding parts, but even when so extended, when the slough is cast off, the cure is usually rapid. During the course of the aphthæ, the fever is slight, but the development of the gangrene it becomes high, and is attended by respiratory trouble and fatal convulsions. The ulcerating aphthæ extend and deepen more rapidly upon the perineum, the edge of the anus, and the membrane of the rectum than in other places, and gangrene is also more frequent in these locations. Of the 56 children, 44 were between 2 and 5 years, 5 between 1 and 2 years, and 7 between 5 and 8 years. 29 cases occurred after measles, 9 idiopathic, 4 after pertussis, 1 each after varicella, erysipelas, pneumonia, and diphtheria. Parrot's treatment is to cover the ulcers with a thick layer of iodoform, and lay charpie over them. This treatment prevents with certainty the occurrence of gangrene, and greatly hastens the cure.

J. FEWSMITH, JR.

15. L. Koenigstein: Examination of the Eyes of New-born Children (*Report of the Vienna Medical Society*).—Königstein has examined the eyes of about 300 new-born children. The results of other examiners have varied in some points, but have all agreed in one important fact, that the eyes of infants may possess all the principal conditions of refraction. Thus Jæger found, out of 100 eyes, 17 hypermetropic, 5 emmetropic, and 78 myopic. Ely found, out of 154 eyes, 21 em., 27 m., and 106 hyp. Horstmann found only 8 per cent myopic.

The author, differing from all these, found not a single case of myopia among 600 eyes, and only a few cases of emmetropia (where the hypermetropia was less than $\frac{1}{6}$), so that all the eyes showed a hypermetropic condition, varying from $\frac{1}{6}$ to $\frac{1}{10}$, and greater in premature children.

In most of the books, it is stated that the color of the iris in infants is, without exception, blue. K. differs somewhat from this. The stroma of the child's iris is devoid of pigment, the posterior surface, covered with pigment epithelium and cloudy media with a dark background, appear blue. The iris of the new-born child is, however, almost never clear blue, but generally gray, with a cast toward blue or green, and the vessels and nerves showing on it as whitish or brownish lines in a beautiful stellate figure. The stroma also occasionally becomes pigmented before birth, and K. has seen several cases of dark-brown iris. All shades are found, from light-blue to dark-brown, and the latter is not so extremely rare. Prof. Exner reports that, in one family, all the children were born with dark eyes.

There were remnants of the pupillary membrane in 21 children out of 281, usually in the form of two or three synechia-like thread.

The appearance of the fundus in children differs somewhat from that in adults; first it is much clearer and fresher, then the optic nerve, as Jæger has already stated, is of a bluish-gray color, and the broad pigment ring around the papilla is especially striking. The difference between arteries and veins is not so clearly marked, either in regard to color, or more particularly, the diameter, since the latter presents itself not as 2:3 or 3:4, but at most as 5:6. Blood extravasations are not so rare. K. observed them in 10 per cent of his material. They are either of radiating form, in stripes following the vessels, or in larger or smaller round spots, often covering the whole fundus. They are rapidly absorbed, and are, therefore, of no further importance, yet it may be supposed possible that very large extravasations might destroy retinal elements, and thus cause amblyopia, discovered later without any apparent cause. These extravasations occur only during delivery, or the changes of circulation incident to the beginning of respiration. Their origin during delivery may be explained by the great pressure exercised upon the child, though it must be confessed that they occur no oftener in cases of severe forceps delivery, face presentations, and very large children than in cases of small children, premature births, or rapid and easy births. It is more probable that the cause lies in the change of circulation and the arterIALIZATION of the blood. K. often observed blood extravasations in the skin in children born cyanotic, who became rosy-colored after several inspirations. The same process probably takes place in the retina.

J. FEWSMITH, JR.

16. Prof. Kaposi: A New Dermatological Remedy (*Analekten Jahrbuch*).—To avoid the unpleasant qualities of tar and yet obtain its important action, Kaposi has experimented with a body obtained from tar, and known in chemistry as β -naphthol.

In scabies, its results have been most excellent. For some months past he has given up entirely the unguentum Wilkinsonii, which had been considered for many years the best itch remedy, and used instead an ung. naphtholi comp., according to the following formulæ: \mathcal{R} Naphtholi, 15; ax. ung., 100; sapon. virid., 50; cret. alb. pulv., 10. \mathcal{M} . This or a simple ung. naphtholi (naphtholi, 15; ung. simp., 100) has all the good qualities of Wilkinson's salve without its disadvantages. It does not stain the skin or clothes, does not smell, and does not irritate the skin, and is at present the regular itch remedy in use in his clinic.

In eczema, K. has used, with very good results, a 5 per cent, later a 2 per cent and $\frac{1}{2}$ per cent alcoholic watery solution of naphthol, parallel with and instead of tinctura Rusci, and he hopes to obtain still better results. Too strong an application may temporarily do harm. In eczema capitis, eczema squamosum, and also in seborrhea, the remedy has proved very effective.

In psoriasis, a fifteen-per-cent or ten-per-cent naphthol salve acts almost as promptly as chrysarobin, but not so constantly. After six or eight applications the psoriatic spots become completely white, just as with chrysarobin, but without the slightest discoloration of the surrounding skin. It is therefore a particularly good remedy for psoriasis of the hands and face. In some cases most extensive and inveterate psoriasis plagues disappeared rapidly.

In pityriasis vesicolor K. also had good results, and in prurigo and ichthyosis the action of both the solution and the salve proved at least

satisfactory. In one case of lupus erythematosus K. prepared a paste out of five-per-cent solution naphthol and amyllum, and after eight applications of it a thin, dry slough formed, on the falling off of which the lupus appeared cured. In lupus vulgaris and epithelioma naphthol does not suffice.

K. concludes that naphthol has proved itself an important remedy which, in many cases, may be used instead of tar, and in certain diseases is to be preferred to it.

17. O. Bran: The Use of Podophyllin and Podophyllo-toxin in Pediatrics (*Arch. f. Kinderheilk.*).—Podophyllin comes from the rhizoma of podophyllum peltatum, and is a brownish mass which, when shaken with hot water, should not discolor it, but in alcohol should make a completely clear and sharply bitter solution. Dr. Podwyssotzky found in podophyllin the active principle podophyllo-toxin, also picro-podophyllin, podophyllic acid, and podophyllo-querine.

According to the experiments made, podophyllin in the dose of 0.08 is a sure cathartic, acting in from six to twenty four hours, and causing profuse secretion from the intestinal membrane and increased peristalsis. The dose for children is set at from 0.01 to 0.02. Brun has used it in children from one to thirteen years of age, and gave from half to one teaspoonful of an alcoholic solution of 0.02, in alcohol 1.0, and syrup 40.0. These doses in children under three years, generally after four to nine hours, but sometimes later, cause from one to three soft stools, and the action upon the intestine continues from two to four days. For children under one year, the dose is 0.0005 to 0.01. For children from one to four years, 0.01; for older children, 0.02, and the longer the constipation the greater dose was necessary to obtain soft stools. Pain in the stomach, when it occurred, disappeared immediately after the stool. Larger doses caused nausea, pain, and weakness.

Podophyllo-toxin was used for twenty-eight children, in doses reaching as high as 0.012 in a solution of 0.05 to alcohol drops 100 (two to ten pro dosi in sweetened water). It acts in proper doses just like podophyllin—for children under one year, 0.001 to 0.002; for children up to four years, 0.002 to 0.004; and for larger children, 0.006 to 0.008. These preparations do not in any way disturb the digestion, and leave behind them no tendency to constipation.

18. Cheadle: Osteal or Periosteal Cachexia, and Scurvy (*Lancet*, July 15th, 1882).—This is the report of a case of scurvy, supervening on rickets, characterized by a resemblance to the so-called osteal or periosteal cachexia, together with muscular debility, periosteal swelling, edema of legs, albuminous urine, and hemorrhagic spongy gums. The child had subsisted the first two months of its life on cow's milk and water—equal parts—with a scanty supply of mother's milk. Then fed on Nestle's food till six months of age, then, during an attack of diarrhea, it was given arrowroot and isinglass. No milk, then, for the next three months. Nestle's food was again administered, and, at the end of that time, the above condition was arrived at.

The patient was put on anti-scorbutic food, potato gruel, milk, raw meat, brandy, no medicine, and rapidly recovered in a few weeks' time.

The author states that he has seen, in other cases, a rickety condition supervene on a strict diet of Nestle's food, and is convinced of the insuf-

iciency of this preparation alone to supply the full elements of nutrition.

T. T. GAUNT.

19. Demme: The Relation of the Red and White Blood-Corpuscles in Infancy (*Abs. in Jahrbch. f. Kindhdkde.*).—PROF. R. DEMME found that it was much more difficult to determine the amount of corpuscles, especially of white corpuscles, in infants' blood than in the blood of adults. This was because of the large quantity of free nuclei (nuclein formation) present, amounting in the blood of a child, two to eight days old, to 350–420,000 in one kgr. of blood. Beside this, the blood of sucklings toward the end of digestion contains a great number of dust-like bodies which render the serum cloudy, and which are in a sort of transformation condition to genuine red blood-corpuscles, and are difficult to exclude from an enumeration. Demme's experiments have been carefully carried out, and give about the following results.

For every one white corpuscle there are,

		A	B
At the age of	12–72 hours,	135	122 red corpuscles.
“	“ 4–7 days,	157	135 “ “
“	“ 8–14 “	165	140 “ “
“	“ 15–30 “	173	145 “ “
“	“ 31–60 “	180	153 “ “
“	“ 61–90 “	185	160 “ “
“	“ 91–120 “	191	172 “ “
“	“ 121–150 “	210	180 “ “

The column under A is for cases nourished exclusively by the mother's breast, that under B for cases nourished by cow's milk. The counting was done two and a half to three hours after feeding. To a given quantity of blood there are more white corpuscles in infancy than in adult life, and the absolute number of all blood-corpuscles is greater in the first days of life than in adults, and the blood richer in hemoglobin, which, however, decreases after about two weeks.

Demme also found between the 15th and 20th days:

		Before the 1st meal,	1 w. to 150 red corpuscles.
25–30 minutes after the	“	1 w. to 155	“ “
3 hours	“	1 w. to 145	“ “
25–30 minutes	“	2d meal, 1 w. to 100	“ “
3 hours	“	1 w. to 142	“ “
25–30 minutes	“	3d meal, 1 w. to 92	“ “
3 hours	“	1 w. to 158	“ “

These relations were disturbed, and there was an increased proportion of white corpuscles when there was indigestion or constitutional disease.

Although these facts are gained with difficulty and the chances of mistake are great, yet the field thus opened for further study is a large one.

J. FEWSMITH, JR.

20. Gravitz: The Theory of Vaccination (*Virchow's Archiv*).—DR. PAUL GRAVITZ, Assistant to the Berlin Pathological Institute, offers a new theory for vaccination. Up to the present the protecting power of vaccination has been explained by two hypotheses: First—that the vaccine consumed some material in the body which was necessary for the development of the vaccine and variola poison, or, second, it introduced

some material into the body which prevented such development. The latter theory has been supported by various analogous processes in preventing fermentation and rotting. Both theories, however, were purely speculative.

The latest discoveries of Pasteur and Toussaint concerning choléra des poules and milzbrand, or carbuncle, open the way to new views. Pasteur showed that a mild variety of the cholera spores could be obtained by cultivation, and that the inoculation of these caused but slight symptoms of the disease, and gave complete immunity against inoculation with what was known to be very malignant poison of the same nature. Toussaint also showed that, by the inoculation of milzbrand blood, which had been warmed to 55° C., no carbuncle was caused, but here, too, immunity was gained against the most active anthrax bacillæ. Klebs denominates the effect obtained by Pasteur and Toussaint as "increase of the power of resistance by previous disease."

Gravitz, in his experiments, leaves out of view the various vegetating fungi, and limits himself to the better known and more easily controlled mould fungus. He claims to prove that from this originally inactive and mild fungus he can develop most malignant varieties, and that the spores of these varieties are so large, they can be separated in their nutritive fluid from the other, mild kinds.

These fungi, artificially rendered malignant, Dr. G. injected direct into the veins of animals.

Such inoculations, when made with fluids from which the malignant spores had been filtered off, or in which they had been rendered unfruitful by continued heat of 55° C., gave a negative result, and absolutely no anatomical changes could be found in the animals when killed from three to eleven days afterward, and they suffered from later inoculations of malignant fungi exactly as those to whom nothing whatever had been done.

Inoculations with physiologically weaker varieties of the malignant fungi did not occasion great general disturbance, but when the animals were killed, on the third day there was well-marked parenchymatous change and fat metamorphosis in the kidneys and liver, opacity of the cardiac musculature, and minute blood extravasations in the ileo-psoas.

Experiments made in from three to ten weeks after such inoculation showed that if the fluid used first was very weak, the animals could not resist the second injection of strongly malignant fluid; but if at the first inoculation, the fluid was *half malignant*, they possessed complete immunity against the most malignant fungi. Now, the author claims that by experience we can determine exactly what strength to make the solution of malignant spores, in order to, not make the animal sick—or, at least, only a little out of sorts—and yet get the anatomical action in the internal organs, and, more important still, render them completely protected against the injection of even large quantities of the most malignant fungus elements.

The two above-mentioned theories of the method of protection by vaccination are, the author claims, overthrown by these experiments. There can be no such thing as an absolute consumption of some material in the blood which is necessary to the growth of the fungi. In the first place, those materials of the organism which are rapidly consumed are as rapidly reproduced, and it is not easy to imagine that there should be sufficient

at one time for the development of an immense quantity of fungi, and that at another time it should be all used up by a minimum quantity of the same spores. Moreover, the mould fungus does not decompose the fluid in which it grows. It simply assimilates as much as it needs, and the rest remains unchanged. Further, there is in the blood an inexhaustible quantity of pepton and albuminous solutions, which, with the addition of oxygen, will nourish an unlimited amount of fungus.

The other theory of the development of some material in the blood which acts as an opposing poison to the fungi could depend only on the development of ammonia or some of its derivatives, and it is not possible to suppose that the blood would retain this any length of time. In fine, all the humoral theories must be given up, because it can be shown that even the inoculation with malignant fungi does not alter the blood so that it will not serve as a nutritive fluid for further growth of the same spores. This is demonstrated. It is also impossible to detect any anatomical changes in either the blood-corpuscles or the cells of other organs.

Gravitz, therefore, suggests—or imagines—that after vaccination or inoculation there is a “battle for existence” between the parasitic spores and the tissue cells; that the latter, by virtue of their greater number and greater energy, are victorious, and that they, in this warfare, gain an increased life-energy as opposed to the parasites which lasts months and years, and descends to coming cell-generations. (*Sic!* ED.)

The preventive inoculation will be the more successful the longer and the more intensely the fungus acts, and the slighter the malignancy of the fungus at the second inoculation, as is demonstrated by clear experiments.

Gravitz then suggests the possibility that this life-energy, won in battle, may descend, not only to later generations of cells, but also from one individual to his descendents, and that this may throw some light on the historic fact that many infectious diseases become less virulent in the course of time. He cites the case of the Esquimaux who were vaccinated in Europe, and all (eight of them) died, and claims that they, coming from a people who were unprepared and unaccustomed to the life-battle with parasitic organisms, died from vaccinia—a parasitic infection which even infants in more cultivated Europe can withstand. (*Sic!* ED.)

Gravitz's work, like those of Pasteur and Toussaint, opens up wonderful fields for future study—if his conclusions are not too imaginary. It has already been answered by studies which seem to show that his premises as to the cultivation of the malignant spores are not yet well established.

J. FEWSMITH, JR.

21. Smith: On Convulsions in Children (*Lancet*, July 8th and 15th, 1882).—DR. EUSTACE SMITH thus writes of this disorder:

A convulsion is necessarily a symptom, and its importance depends chiefly on the cause, together with the age of child, the nature and severity of the attack.

Elcampsia may take place in utero, causing death and premature labor, but most commonly occurs during the first two years of life, and, in exceptional cases, may endure till the ninth or tenth year.

In some families, convulsions occur quite generally; all of the chil-

dren may be affected. In other cases, only the boys; in other cases, the girls.

Rickets predisposes strongly to convulsions in children. The child's nutrition has nothing to do with the attacks, except in rare cases, where the patient is greatly reduced by long-continued interference in nutrition. In this condition, indeed, the convulsions are referable, not to a reflex origin, but indicate grave cerebral disease.

The cause of the eclampsia may sometimes be ascertained by the character of the seizure; for example, when the spasms are limited to one side of the body, or to one limb; when paralysis of the face remains after the attack; when the convulsion occurs without loss of consciousness, or when the stupor and drowsiness are greatly prolonged after cessation of the fit; if paralysis continues longer than a few hours, especially if associated with contraction of muscles, we may apprehend cerebral lesion.

Cerebral congestion is a cause of convulsions, and serous effusions and minute capillary hemorrhages may occur.

Convulsions occur in advanced cases of the exanthemata, caused, according to Dr. Bastian, to embolic plugging of minute cerebral arteries.

It is a matter of serious importance to distinguish eclampsia from epilepsy.

The latter is rare of occurrence under two years of age; after that period it is often impossible to exclude epilepsy.

If the fit lasts an hour or more without intermission, we may call it eclamptic.

Convulsions occurring in children after the age of three or four, unless due to cranial lesion, are generally uremic, or referable to an approaching febrile disease.

Convulsions, at first eclamptic, may pass into epileptic, *first*, when there is a strong neurotic inheritance; *second*, when the convulsions have caused a secondary cerebral lesion.

Convulsions excited by pertussis, occurring with embolus, congestion of cerebral vessels, thrombosis of cranial sinus, or diffused collapse of lung are very serious.

Eclampsia occurring late in measles or scarlet fever is a very grave symptom.

Epilepsy or idiocy may be the termination of frequently repeated convulsions.

The author favors the administration of chloral and bromide, the latter being especially indicated in convulsions complicating pertussis.

He holds chloroform inferior to chloral.

The general health of the child should be looked to, and, in every case, the cause should be removed as far as possible.

T. T. GAUNT.

22. Goodhart and Phillips: The Treatment of Acute Chorea by "Massage," and the Free Administration of Nourishment (*Lancet*, Aug. 5th, 1882).—Under this heading is an elaborate report of a dozen cases of chorea, treated at the Evelina and Guy's Hospitals, on Dr. Weir Mitchell's plan of treatment of the nervous exhaustion of women, and with decided success in the majority of cases. The results claimed by the authors are:

1st. A decided increase in weight.

2d. Rapid subsidence of all the more violent movements, and it has happened that, after two or three days' treatment, a child, quite uncontrollable before, has been able to sit up in bed in a fairly quiet mind.

3d. The extremities are no longer cold, and as a further evidence of the good influence on the circulation, the pulse falls and becomes more regular.

4th. Shampooing (massage) is a powerful sleep-producer, and children, as a rule, sleep soundly after being shampooed.

T. T. GAUNT.

23. Finlayson: Idiopathic Salivation in a Child (*Glasgow Medical Journal*, Aug., 1882).—Salivation seldom occurs in childhood, except in the process of dentition, and with stomatitis. This case, reported by Dr. Finlayson, was of a child six years of age, who, at the time of its admittance at the hospital, was secreting between twenty-eight and thirty-four ounces of saliva during twenty-four hours. The only other symptoms were pain in the belly, with occasionally vomiting and diarrhea. The patient was put on extract of belladonna, gr. $\frac{1}{4}$, three times daily, which was gradually increased to gr. $\frac{3}{4}$. In a couple of weeks, a diminution in the amount of saliva was observed, and gradually this became more marked, till at the end of a month after admission, she was discharged well. The author is inclined to ascribe to the remedy the credit of the cure.

T. T. GAUNT.

24. Uffelmann: Examination of the Feces of Naturally Nourished Children (*Deutsches Arch. f. klin. Med.*).—The most important work on this subject is that of Wegscheider. He found that the albumen of the milk was completely digested, but the fat was not. The latter appeared in the feces, partly unchanged and partly in the form of fatty acids and soaps. He also found in the feces all the salts of the milk, unchanged bile coloring matter, no leucin or tyrosin, but always cholesterin.

Biedert estimated the proportion of fat in the feces at 3.8–20.3% (average 9.73%).

Uffelmann's examinations were made in children from eight days to one year old, nourished exclusively with breast milk, and the feces always examined perfectly fresh. The amount of daily feces varied from 3.0 to 40.0, on an average 3% of the food taken, and the color, consistence, smell, etc., were according to the usual descriptions.

Under the microscope the feces, without any reagents, present numerous fat globules in a finely granular matrix or groundwork. By adding dilute osmic acid the globules are colored brown, and we get a clear view of their irregular division and arrangement. Beside these there are abundant crystals of the fat acids, especially margaric crystals, pavement epithelium (from extremity of rectum), intestinal (cylindrical) epithelium, mucus or lymph-corpuscles, and yellowish bodies which resist acids and alkalies, and whose nature is as yet unknown. Further, lime salts are often seen, generally from combination with fatty acids, also a few cholesterin crystals, bilirubin crystals, and always fungoid elements.

Treatment with methylanilin-violet reveals *protein* and stringy mucus.

If feces, apparently homogeneous, are thinned in water, clearer looking bodies, in the form of coagula, flakes or lumps are separated. These are usually called casein coagula, but the microscope shows that they consist principally of fat globules held together by a sort of connective substance, and containing lime crystals, micrococci, and bacteriae.

Chemical examination. An ethereal extract of fresh feces contains fat, fat acids, milk acid, cholesterin, cholal acid, and bilirubin. Evaporation of an alcoholic extract leaves cholesterin crystals, fat acid crystals, and leucin.

An extract made with a $\frac{1}{2}\%$ watery solution of hydrochloric acid contains albuminate and peptone, fat acids, urobilin, sugar, and salts.

The spectroscope gives a clear urobilin band in only the watery solution.

The water percentage of feces, from which the urine was excluded, averaged 84.9%. The author makes the proportion of albuminate and peptone as high as 1.5%. Wegscheider denied the presence of the former and only occasionally found the latter. U. never found sugar. Of the 15% solid matter, 1.5% was inorganic, and 13.5% organic matter.

J. FEWSMITH, JR.

25. Clemens Paster (Munich): Macroglossus and Macrocheilon (*Jahrbch. f. Kindhilkde.*, XVIII., 2).—In searching through the literature of the subject, the author finds the relation of hereditary cases of this trouble to acquired to be about as four to three. It is slightly more frequent in females. The author's conclusions are:

1. The cavernous macroglossus and macrocheilon is to be strictly separated from the fibroid form, which may externally have some resemblance to it.

2. Cavernous macroglossus and macrocheilon is to be regarded as a true *new growth*.

3. This growth has, in consequence of the involvement of the lymphatic system, a certain relation to elephantiasis arabum and pachydermia lymphangiectatica, but it cannot be identified with these processes, *id est*, it cannot be considered as a partial elephantiasis.

4. According to its macroscopic and microscopic appearances, and also its development, it belongs to the class of cavernous angiomata, and is analogous to the cavernous, venous tumors.

5. Its genesis is partly from ectasis of the lymph-vessels and partly from new tissue.

6. In regard to its etiology, no definite opinion can be given at present—as is, indeed, the case in regard to most true new growths.

J. FEWSMITH, JR.

26. Dr. Wilh. Diem: Typhoid Fever in a Child of the Year (*Jahrbch.*, XVIII., 3).—After narrating an extremely interesting case of the above, in which the diagnosis was extremely difficult, and in fact not made till late in the disease, but then well substantiated, the author concludes:

1. Typhoid fever may occur in the first year.

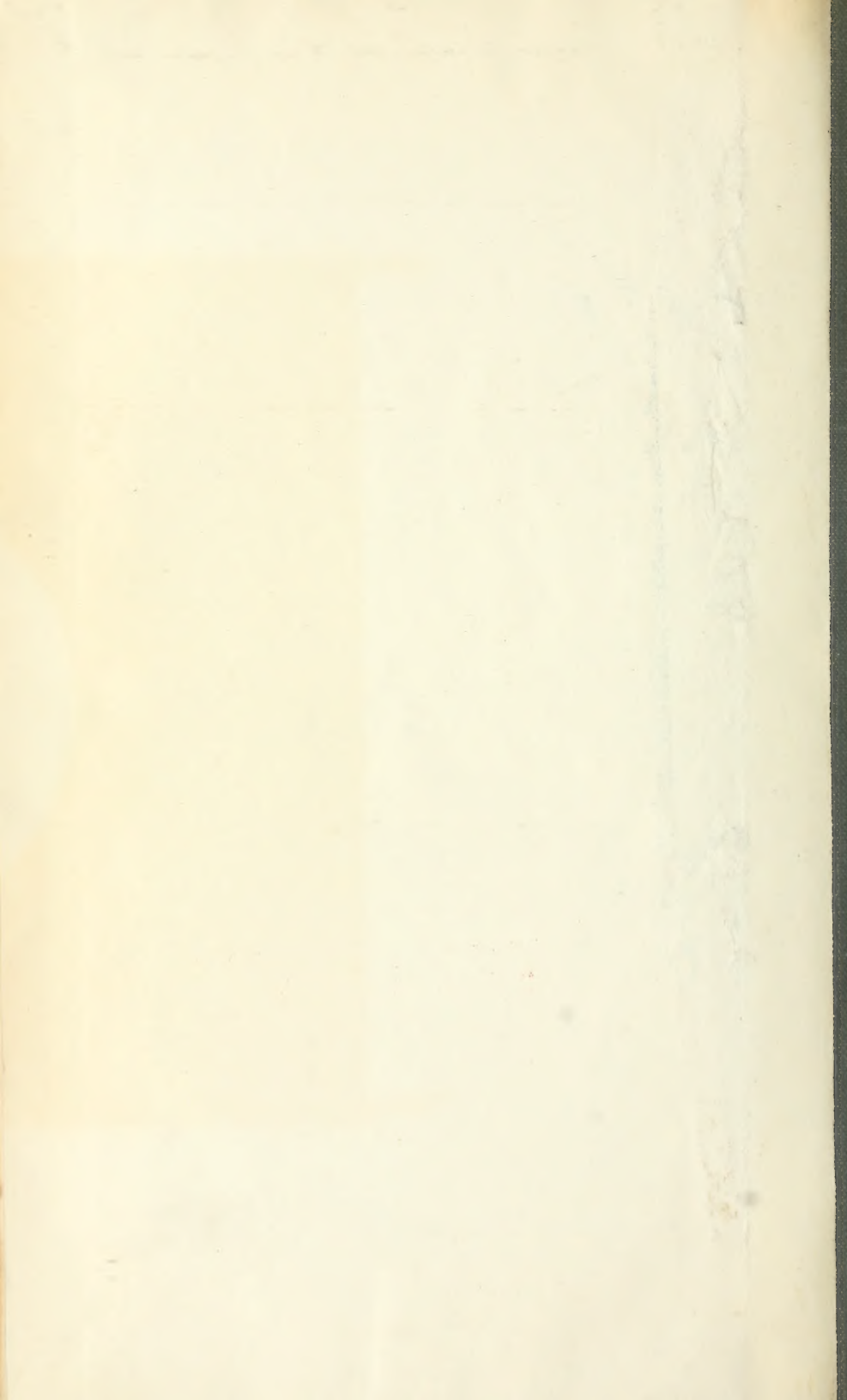
2. It may be easily confounded with enteritis or another acute disease.

3. In diagnosing we may follow Roger's rule: "If one observes typhoid in children in its entirety, it may be recognized without doubt by the *variety* of its symptoms and the *pathognomonic union* of thoracic, abdominal, and cerebral manifestations. If only one form presents itself, or if one group of symptoms is absent, the diagnosis is not so easy. (Not so easy! author.) For of all the symptoms which in regular succession characterize the stages of typhoid fever, none is pathognomonic with the exception of the eruption."

The author remarks that this has always been his rule for adults, and points to its application in his above-mentioned case, and the difficulty he met with.

J. FEWSMITH, JR.





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